

# KH-3500

HG  
PIONEER STEREO MUSIC CENTRE

EINGANG

14. SEP. 1976

*Badelt*

## SERVICE MANUAL



Original

## SPECIFICATIONS

Semi-Conductors . . . . . AF: 41 Transistors, 10 diodes  
RF: 1 IC, 9 transistors, 8 diodes

### AMPLIFIER SECTION

Continuous Power Output  
(40 Hz~40 kHz, both  
channels driven) . . . . . 10W + 10W/8Ω, 12W + 12W/4Ω  
Total Harmonic Distortion  
(Continuous Rated Power  
Output) . . . . . No more than 1%  
Output Impedance . . . . . 8Ω (Speaker and headphones)  
Input Level . . . . . MIC: 0.5 mV  
Input Impedance . . . . . LINE (AUX): 75 mV  
MIC: 600Ω (Matching Impedance)  
LINE (AUX): More than 50kΩ

### RADIO SECTION

Frequency Range . . . . . FM: 88~108 MHz  
MW: 525~1,605 kHz  
LW: 150~350 kHz  
Sensitivity . . . . . FM: 2.5μV (IHF)  
MW: 160μV/m (Bar Antenna  
IHF)  
LW: 500μV/m (Bar Antenna)

### TAPE DECK SECTION

Cartridge . . . . . PHILIPS-type cassette  
(C-30, C-60, C-90)  
Wow and Flutter . . . . . 0.15% (WRMS)  
Rewind Time . . . . . Approx. 95 sec. (C-60)  
Fast Forward Time . . . . . Approx. 95 sec. (C-60)  
Cross Talk . . . . . More than 60dB  
Signal to Noise Ratio . . . . . More than 45dB  
Erasing Ratio . . . . . More than 60dB

### PHONO SECTION

Speed . . . . . Two speed: 33-1/3 and 45 rpm  
Wow and Flutter . . . . . Less than 0.08%  
Motor . . . . . 4 pole synchronous type  
Cartridge . . . . . PC-135 induced magnet type  
Stylus point: 0.6 mil diamond  
Stylus for replacement: PN-135  
Tracking force: 1.8g to 2.3g  
Power Requirements: AC 220/240V 50 Hz  
Power Consumption: Less than 55W  
Dimensions (WxHxD): 510 x 235 x 420mm  
(20-1/8 x 9-1/4 x 16-1/2 in.)  
Weight . . . . . 13.6 kg (30 lbs)

 PIONEER

22 L

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# 1. PARTS LOCATION

KH-3500

- Main Unit

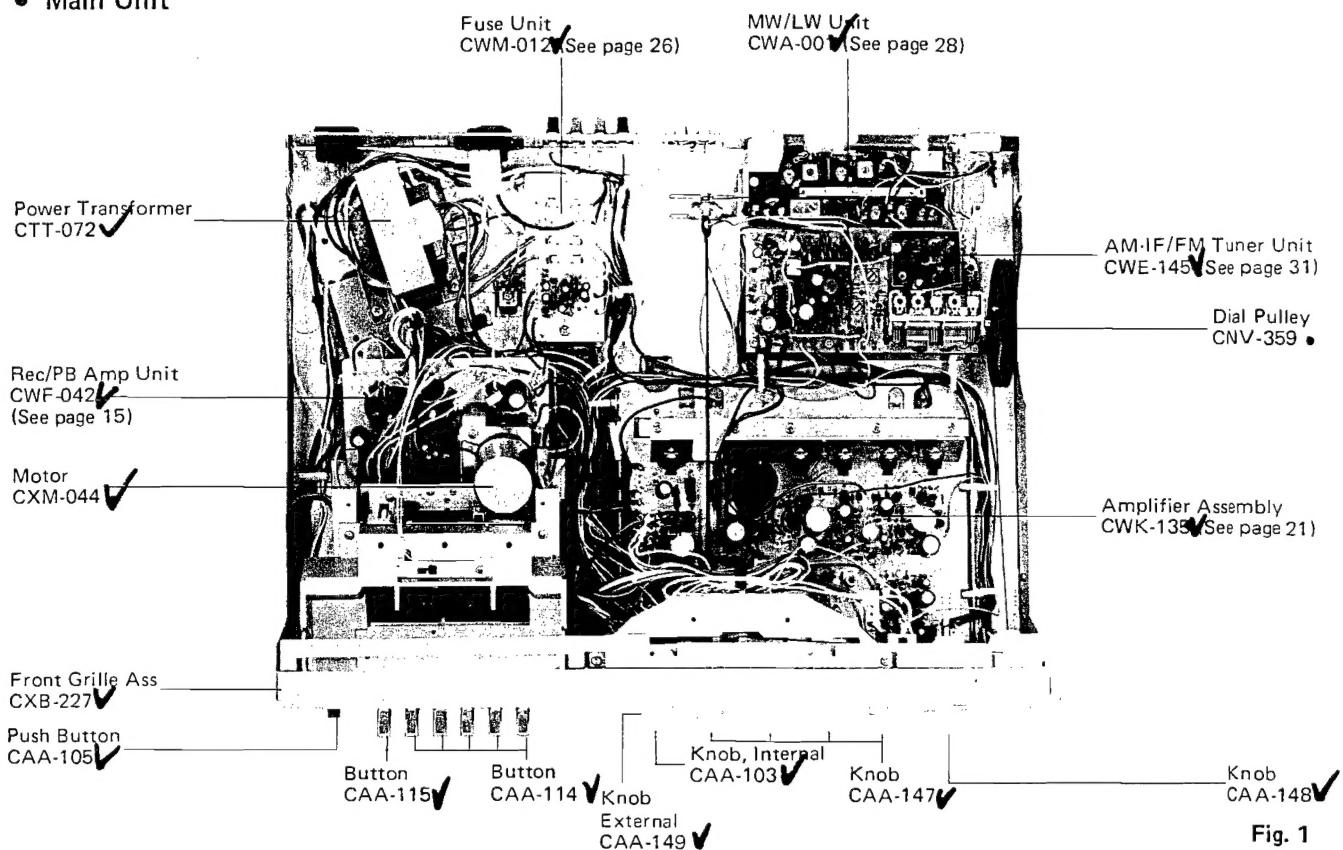


Fig. 1

- Player Unit

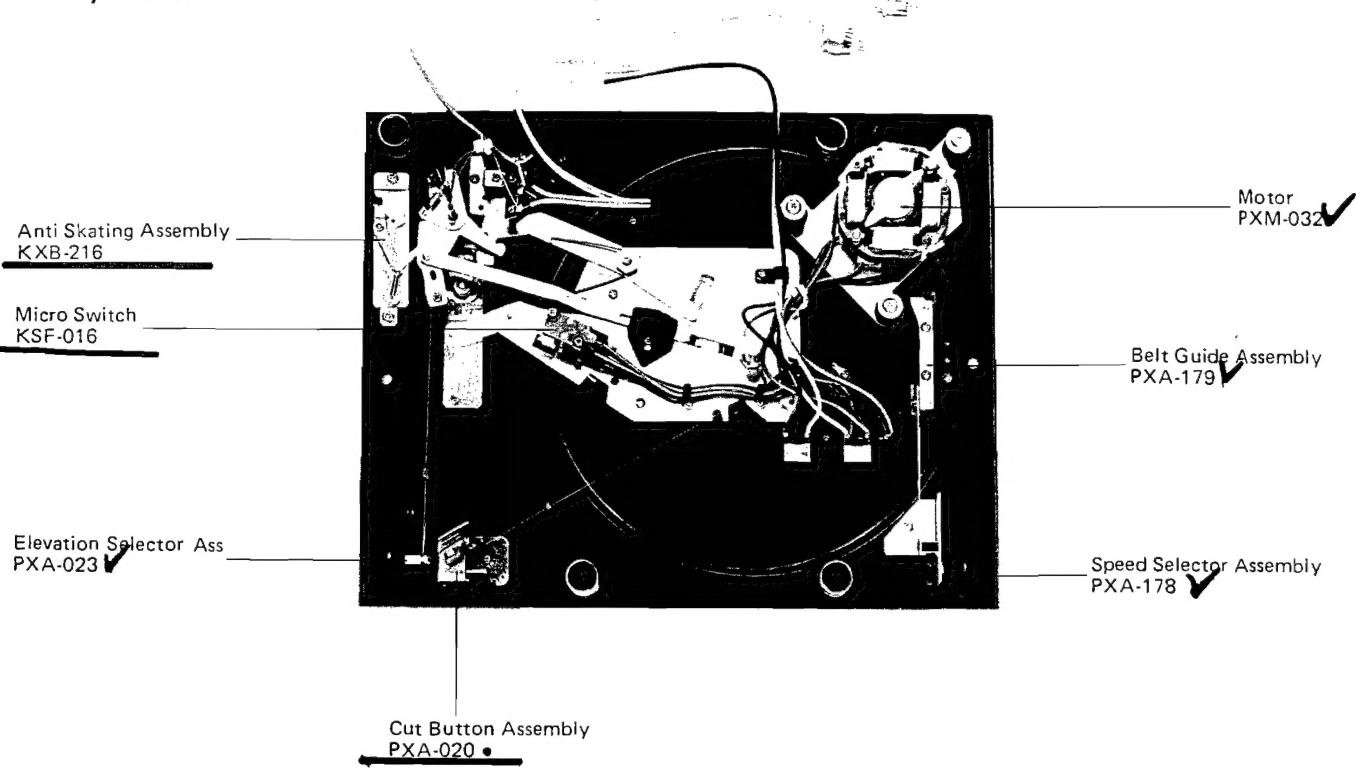


Fig. 2

## 2. CIRCUIT DESCRIPTION

- Circuit Block Diagram in Playback Mode

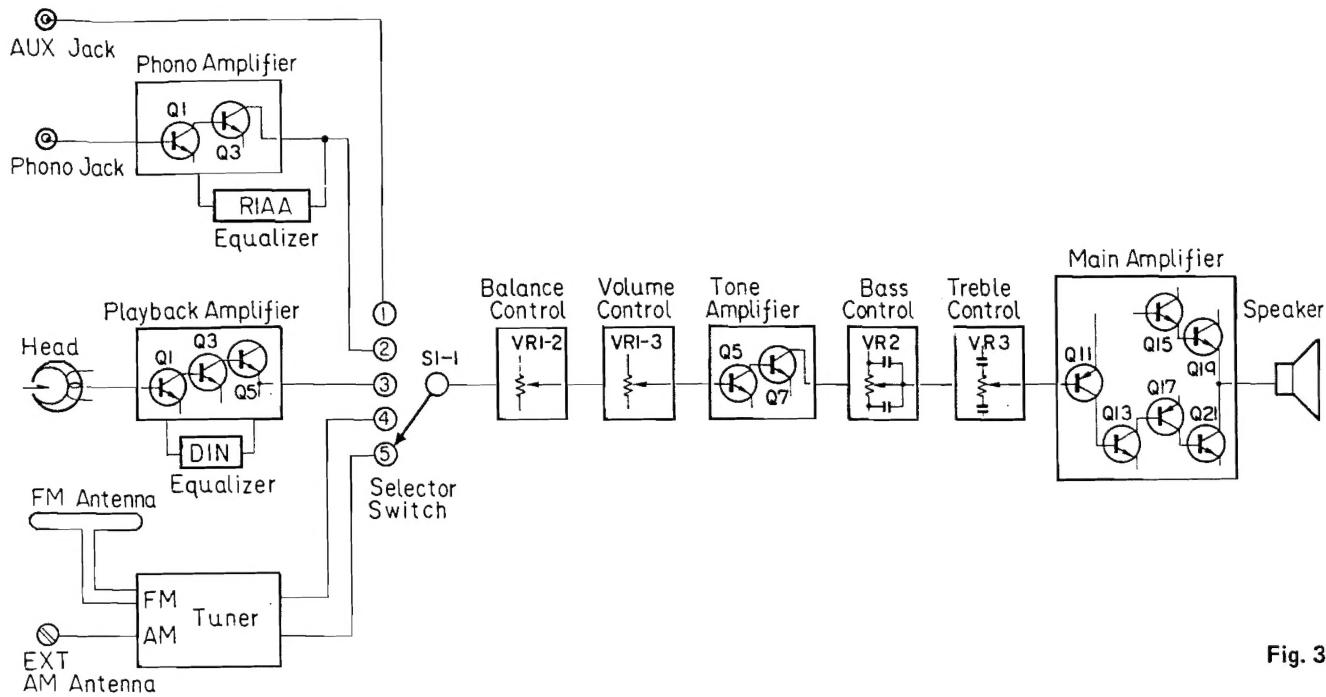


Fig. 3

Selector switch S1-1, is used to select AM, FM, TAPE, PHONO and AUX modes of operation. When TAPE is selected, the signal from the cassette tape is amplified by the playback amplifier (3-stage direct connection amplifier). When PHONO is selected, the signal is amplified by the phono amplifier (2-stage direct connection amplifier). Going through VR1 this signal is amplified by the

tone amplifier (gain 30 dB) and transmitted to the tone control (VR2, 3). It is further amplified by the main amplifier (gain 31 dB) and then sent to the speaker. Figures 4-A and 4-B illustrate the characteristics of the equalizer of the playback amplifier and the phono amplifier.

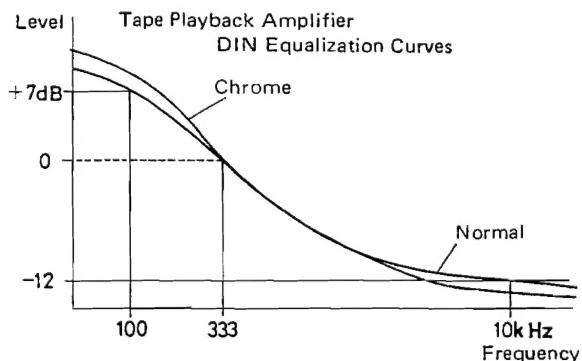


Fig. 4-A

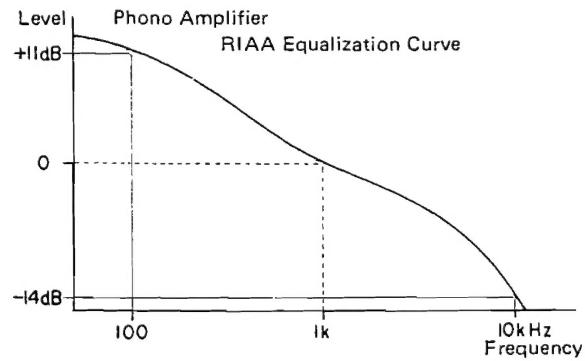


Fig. 4-B

- Circuit Block Diagram in Record Mode

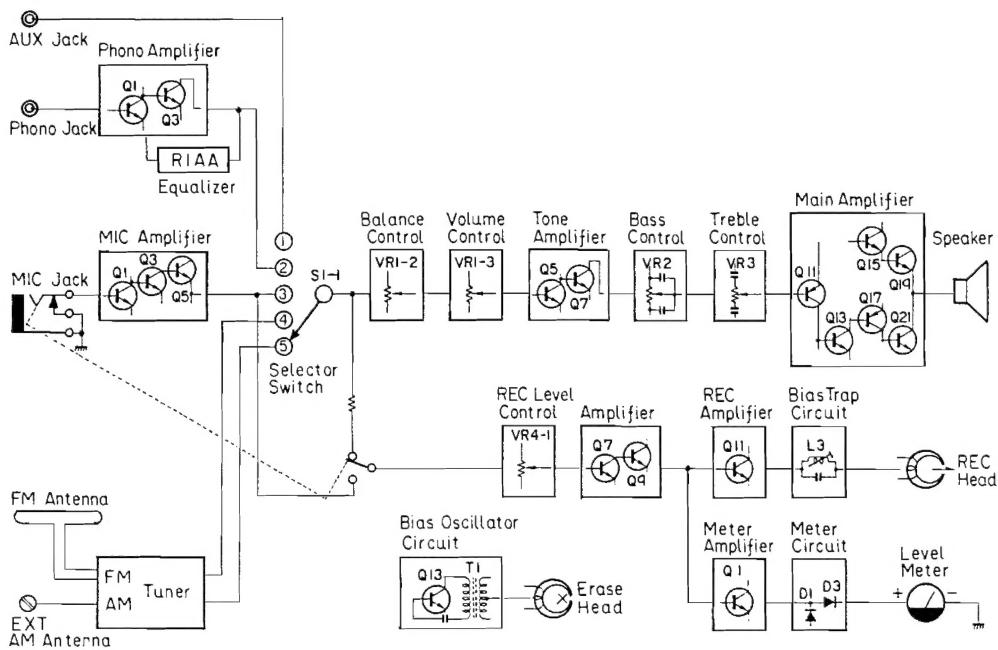


Fig. 5

Signals selected by selector switch S1-1 undergo level control of VR4-1 (REC level control), amplified by the direct connection amplifier and then transmitted to the REC amplifier. These signals are finally sent to the REC head. The bias oscillator (Q13) oscillates at about

60kHz. When a microphone is inserted into the MIC jack, the MIC jack switch is automatically changed and only microphone signal is recorded regardless of the position of the selector switch. To monitor MIC signals from the main amplifier, set the selector switch at TAPE.

- Level Meter Circuit

Signals transmitted to the 2-stage direct connection amplifier (Q7, 9) are amplified, and the emitter follower circuit (Q1) are regulated, and the two diodes (D1, 3) perform half-wave, voltage doubler rectifier circuit and actuate the level meter. This level meter functions during both recording and playback (Fig. 6).

- Full Auto Stop Circuit

As long as the tape is running, magnet turns, reed switch (S3) repeats ON-OFF, Q14 also repeats ON-OFF and a pulse is emitted. By means of this pulse, the electrical potential of "A" repeats rise and fall at a voltage lower than 7V. When the magnet stops turning (tape stops running), the electrical potential of "A" rises and capacitor C59 is charged. Then Q15 and 16 becomes ON and the solenoid is actuated. When the solenoid creates suction, the interlocked lever starts motion to actuate the auto stop mechanism. S4 is interlocked with the PAUSE lever, and so designed that the solenoid does not function even if the tape stops running while S5 is pushing the PAUSE lever. S5 is interlocked with the PLAY lever, and with the PAUSE lever engaged, F.F. and REW can be performed and the auto stop circuit functions when the tape comes to the end.

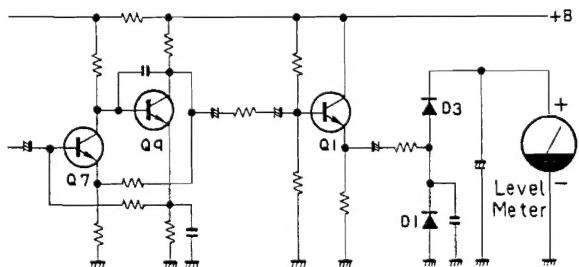


Fig. 6

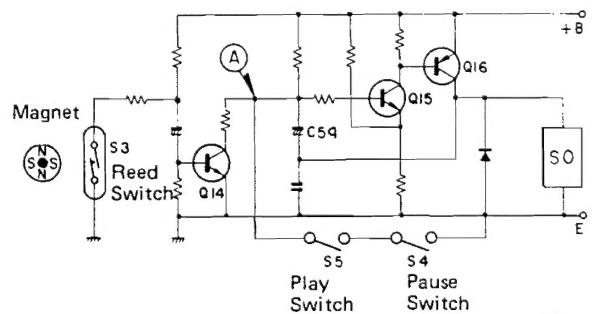


Fig. 7

## CIRCUIT DESCRIPTION

- FM/AM (MW and LW) Tuner Block Diagram

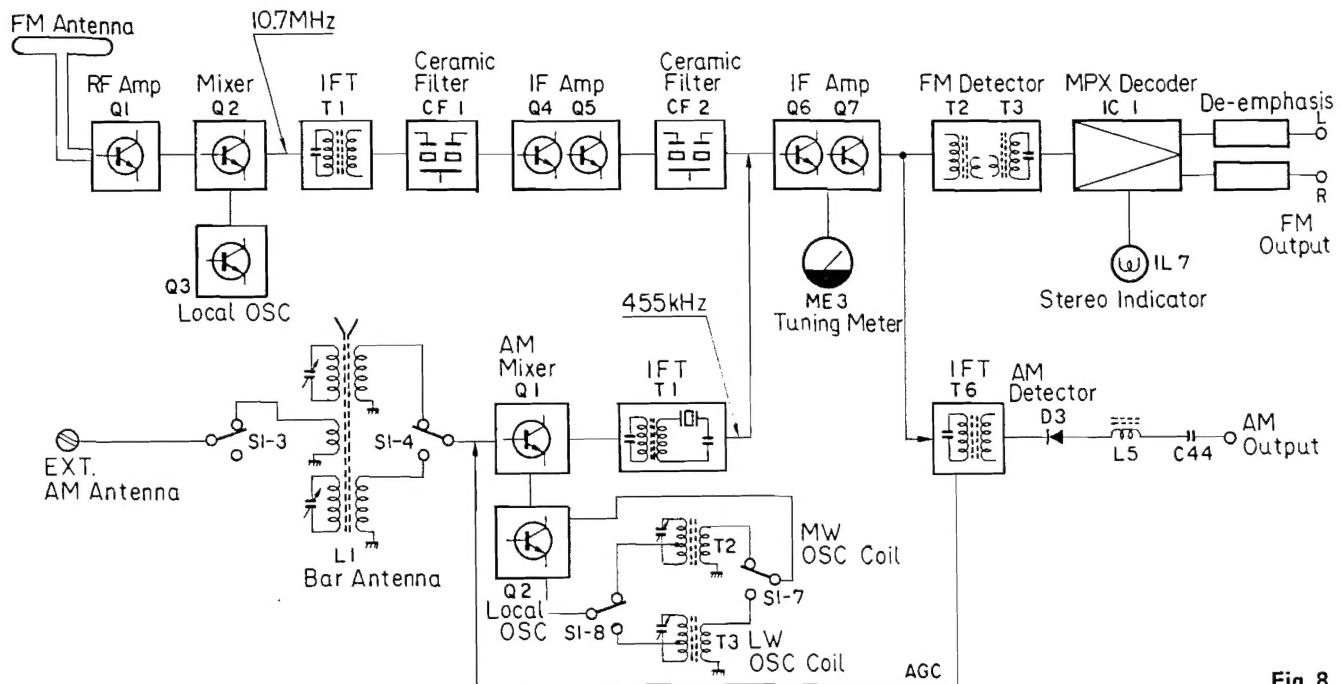


Fig. 8

## 3. DISASSEMBLY

- Cabinet Disassembly

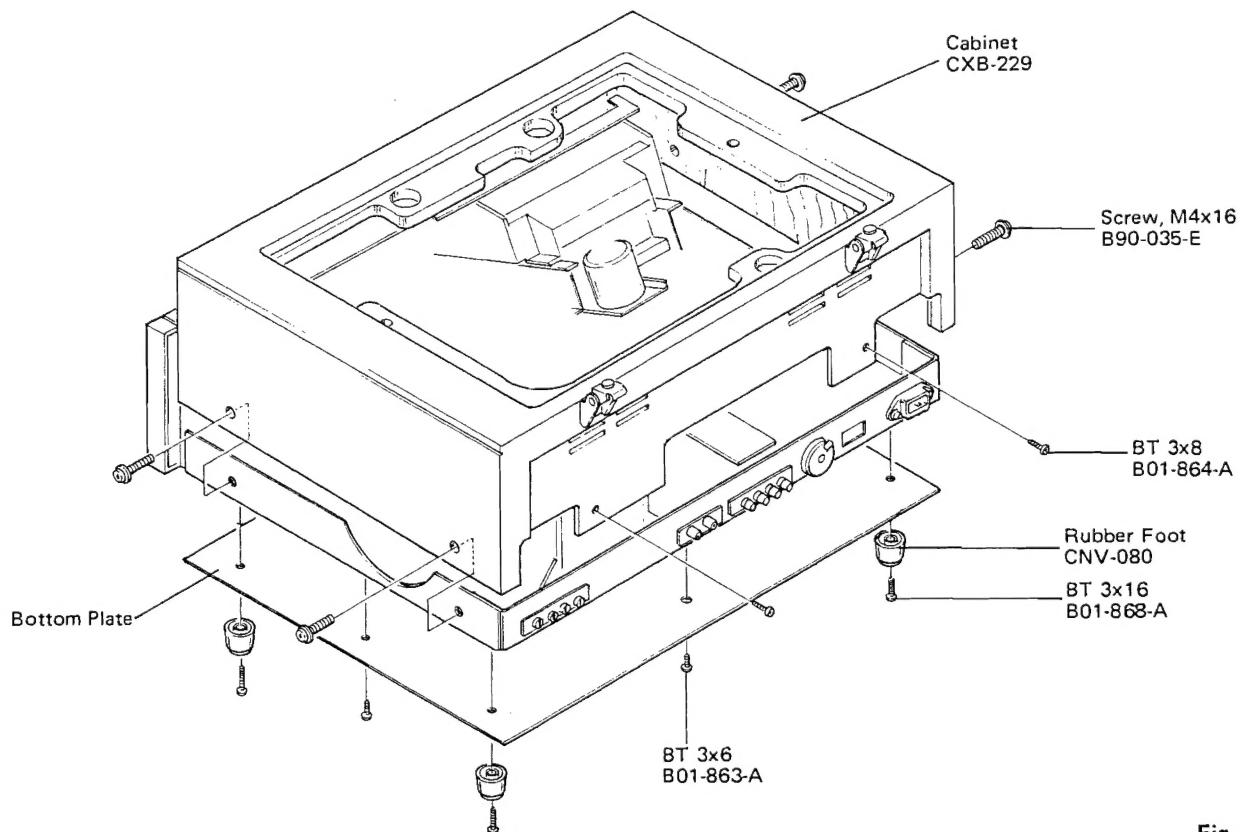


Fig. 9

- Replacement of Buttons

When replacing buttons (REC, REW, F.F., PLAY, STOP/EJECT and PAUSE), pull them straight out. Do not bend or turn the levers to avoid deformation.

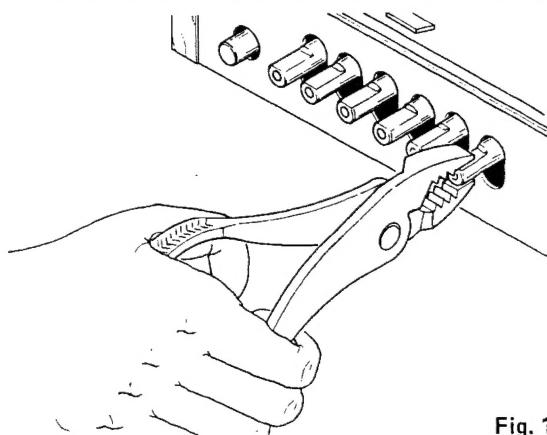


Fig. 10

## 4. ADJUSTMENT

### 4.1 RECORD BIAS AND BIAS TRAP ADJUSTMENT

- Connection Diagram

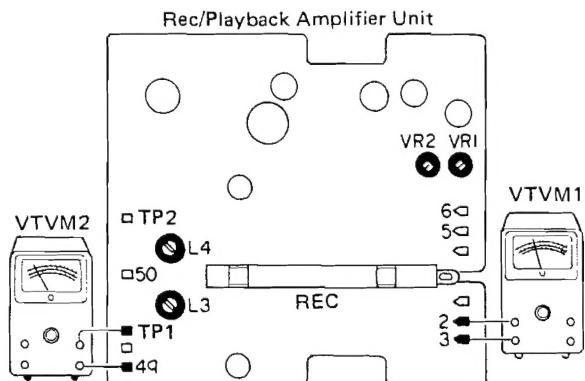


Fig. 11

- To Adjust

1. Set the TAPE SELECTOR switch to normal position.
2. Put the tape in recording condition by pushing the RECORD lever.
3. Adjust trap coil L3 so that the fluctuation of VTVM2 needle is minimal.
4. Adjust VR1 to keep the fluctuation of VTVM1 at  $400\mu\text{A}$  (4.0mV).
5. Adjust Rch in a similar manner.

NOTES:

1. Make these adjustments in non-signaling condition.
2. If the rec/playback frequency characteristic does not meet the standard value, adjust the bias current by the following steps:
  - 2.1 When the frequency is lower than standard, make it  $30\mu\text{A}$  per 1dB lower than  $400\mu\text{A}$  (4.0mV).
  - 2.2 When the frequency is higher than standard, make it  $30\mu\text{A}$  per 1dB higher than  $400\mu\text{A}$  (4.0mV).

### 4.2 TO CHECK RECORD CURRENT

- Connection Diagram

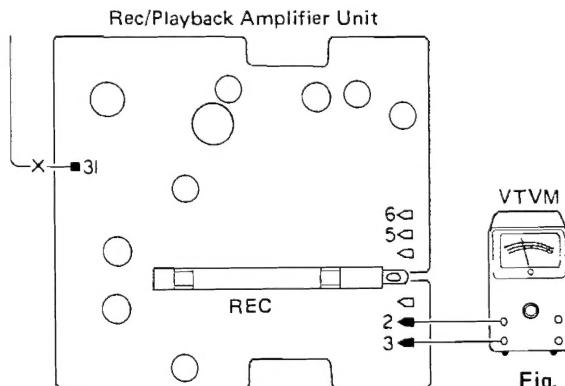


Fig. 12

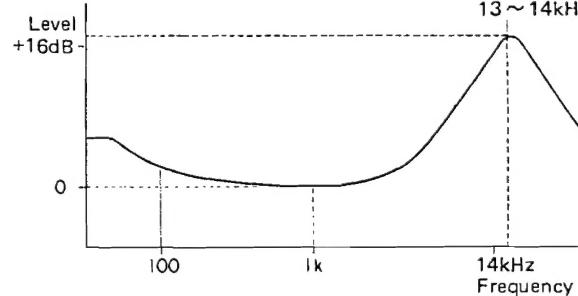


Fig. 13

- To Adjust

1. Set the TAPE SELECTOR switch to normal position.
2. Disconnect the lead wire of No. 31 bias current of the rec/playback amplifier unit.
3. Add 1kHz,  $-18\text{dB}$  input signal to the AUX terminal and set the selector switch (S1) at AUX.
4. In recording condition by pressing rec lever, adjust rec level control so that the record level meter indicates 0VU. After the adjustment, VTVM needle indicates  $45\mu\text{A}$  (0.45mV). Next, when the input is adjusted to 14kHz, record current rises to about +16dB. At the rise limit, the record current is 13kHz to 14kHz.

NOTE: Check rec/playback frequency specifications at  $-20\text{VU}$  record level.

## ADJUSTMENT

### 4.3 FM IF ADJUSTMENT

- Connection Diagram

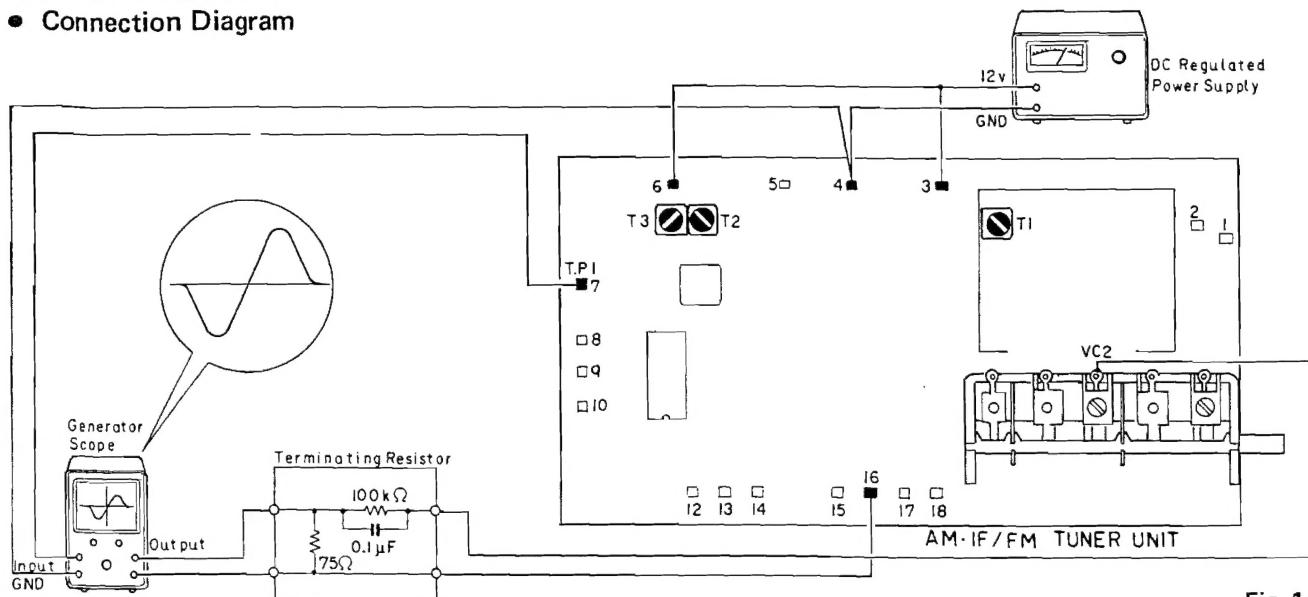


Fig. 14

- To Adjust

1. Feed a signal of 40 to 60dB from the generator scope to the RF circuit variable capacitor "hot" side (VC2) or a signal of about 100dB may be applied directly to the antenna terminals.
2. Tune the core (white) of IFT T1 to obtain maximum "S" wave on the generator scope.
3. Adjust the cores of T2 (gray) and T3 (blue) so that maximum amplitude and optimum linearity are obtained.
4. When increasing the generator scope output, check to make sure the waveform, does not collapse. If a significant tendency to collapse is noted, repeat the adjustments of 2 and 3.

NOTE: 1. If other waves appear, in addition to the S curve, adjust the variable capacitor slightly to remove spurious traces.

2. It is not essential to match the 10.7MHz marker to the S curve center point.

### 4.4 FM TRACKING ADJUSTMENT

- Connection Diagram

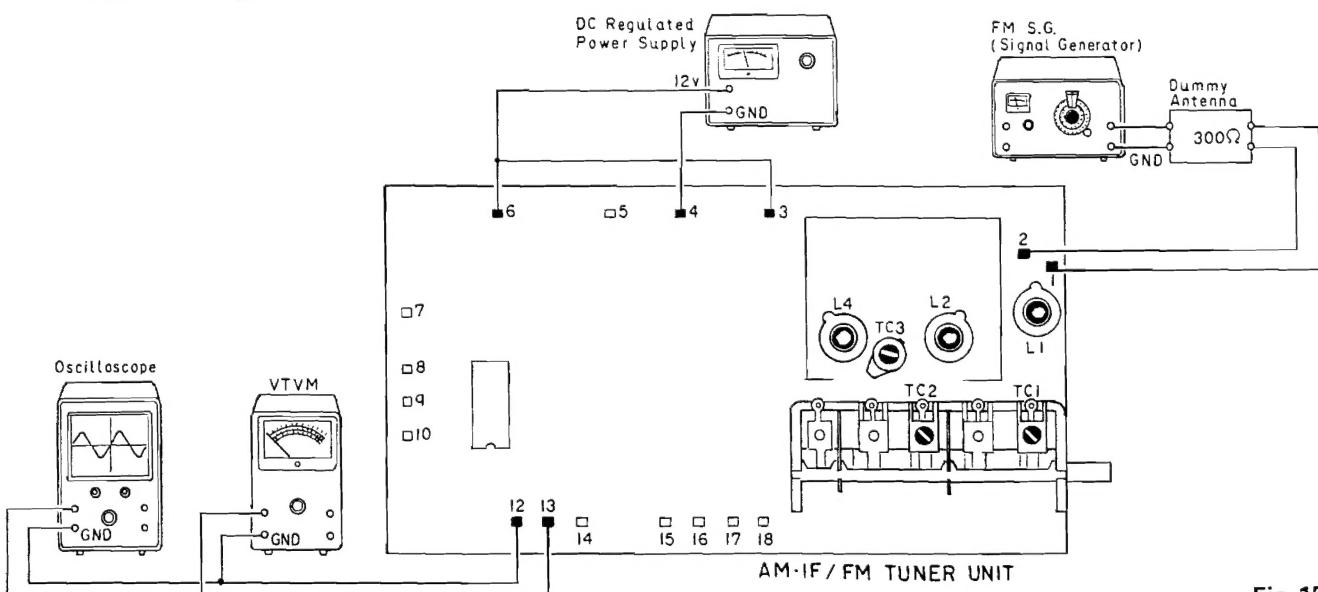


Fig. 15

- To Adjust

1. Set the variable capacitor to maximum capacity position and set the signal generator at 87MHz, 30% modulation at 400Hz, with a signal level of 20 to 40 dB.
2. Adjust L4 to obtain maximum low frequency output from the tuner.
3. Set the variable capacitor to minimum capacity position, and apply a 109MHz signal from the signal generator. Tune TC3 for maximum high frequency tuner output.

4. Repeat procedures 1 through 3 to establish the band width of 87 to 109MHz.
5. Set signal generator frequency at 90MHz and tune the variable capacitor for maximum reception. Peak the output by adjustment of L1 and L2.
6. Set signal generator frequency at 106MHz and tune to the signal with the variable capacitor. Peak the output by adjustment of TC1 and TC2.
7. Repeat procedures 5 and 6 for optimum tracking at both ends.

S.G. frequency	Variable capacitor position	Adjustment point	Circuit section
87MHz	Maximum capacity	L4	OSC
109MHz	Minimum capacity	TC3	OSC
90MHz	Tuned position	L1 L2	ANT RF
106MHz	Tuned position	TC1 TC2	ANT RF

#### 4.5 FM MPX ADJUSTMENT

- Connection Diagram

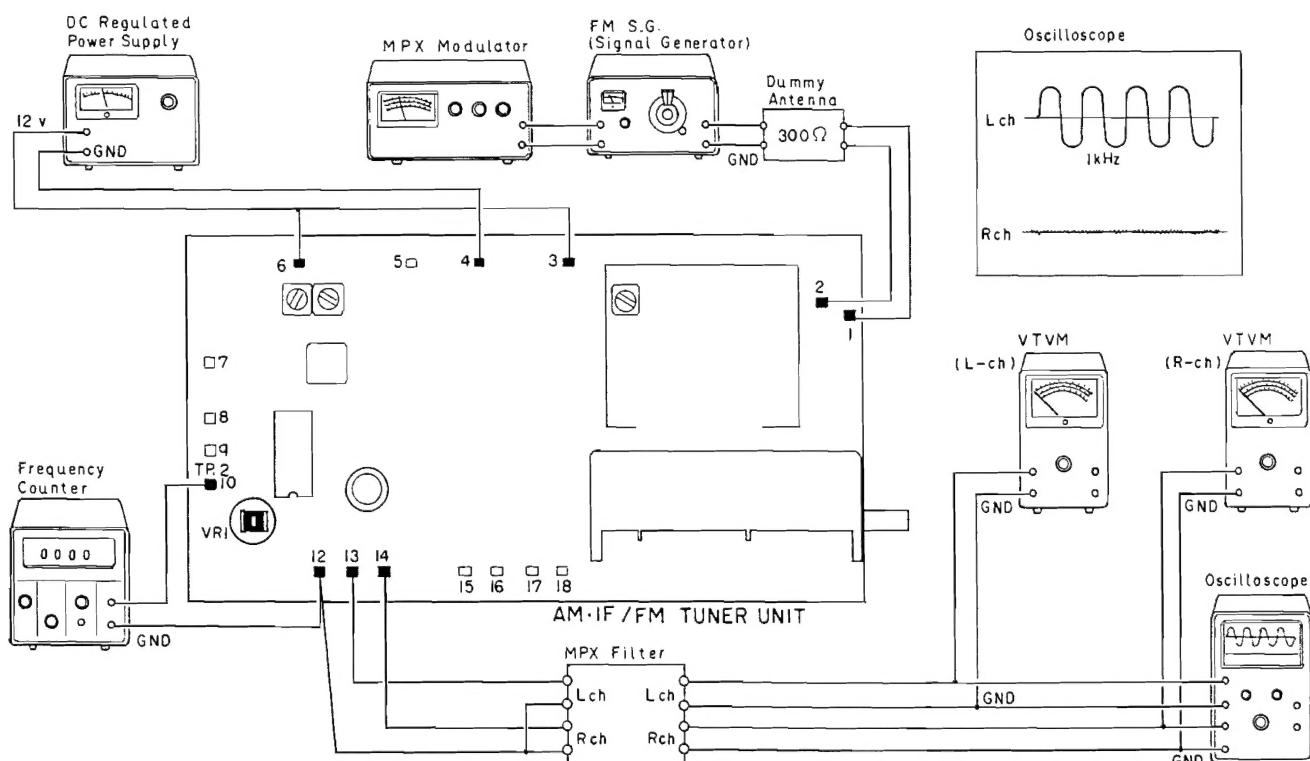


Fig. 16

## ADJUSTMENT

### • To Adjust

1. Apply a 98MHz non-modulation signal with an output level of 60dB from the signal generator to adjust VR1 so that the frequency counter indicates  $19\text{kHz} \pm 20\text{Hz}$ .

2. Select signal generator modulation as follows:

Modulation frequency

1kHz

Percentage of modulation

Pilot 10% (7.5kHz Dev.)

Main 100% (6.75kHz Dev.)

3. Tune to a 98MHz signal.

4. Set the signal generator level to 60dB and select L-side modulation. Make sure separation is optimum (R-side output at minimum). Similarly ascertain L-side output.

NOTE: Alignment can be made without an MPX filter, however, adjustment will be difficult owing to the effects of the 19kHz and 38kHz carrier leak.

## 4.6 AM (MW AND LW) IF ADJUSTMENT

### • Connection Diagram

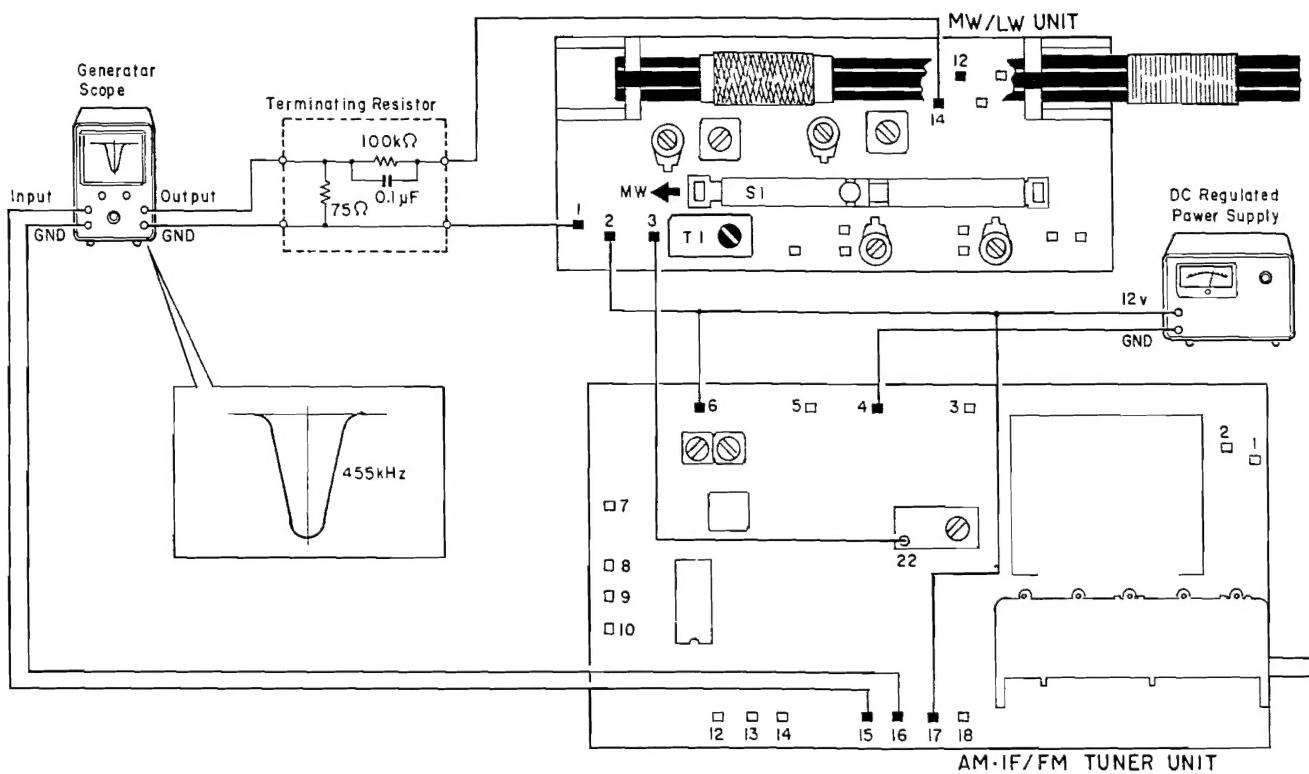


Fig. 17

### • To Adjust

1. Apply a 455kHz signal with an output level of 40~60dB from the generator scope to adjust T1 so that maximum amplitude and symmetrical waveform are obtained on the generator scope.

#### 4.7 MW TRACKING ADJUSTMENT

- Connection Diagram

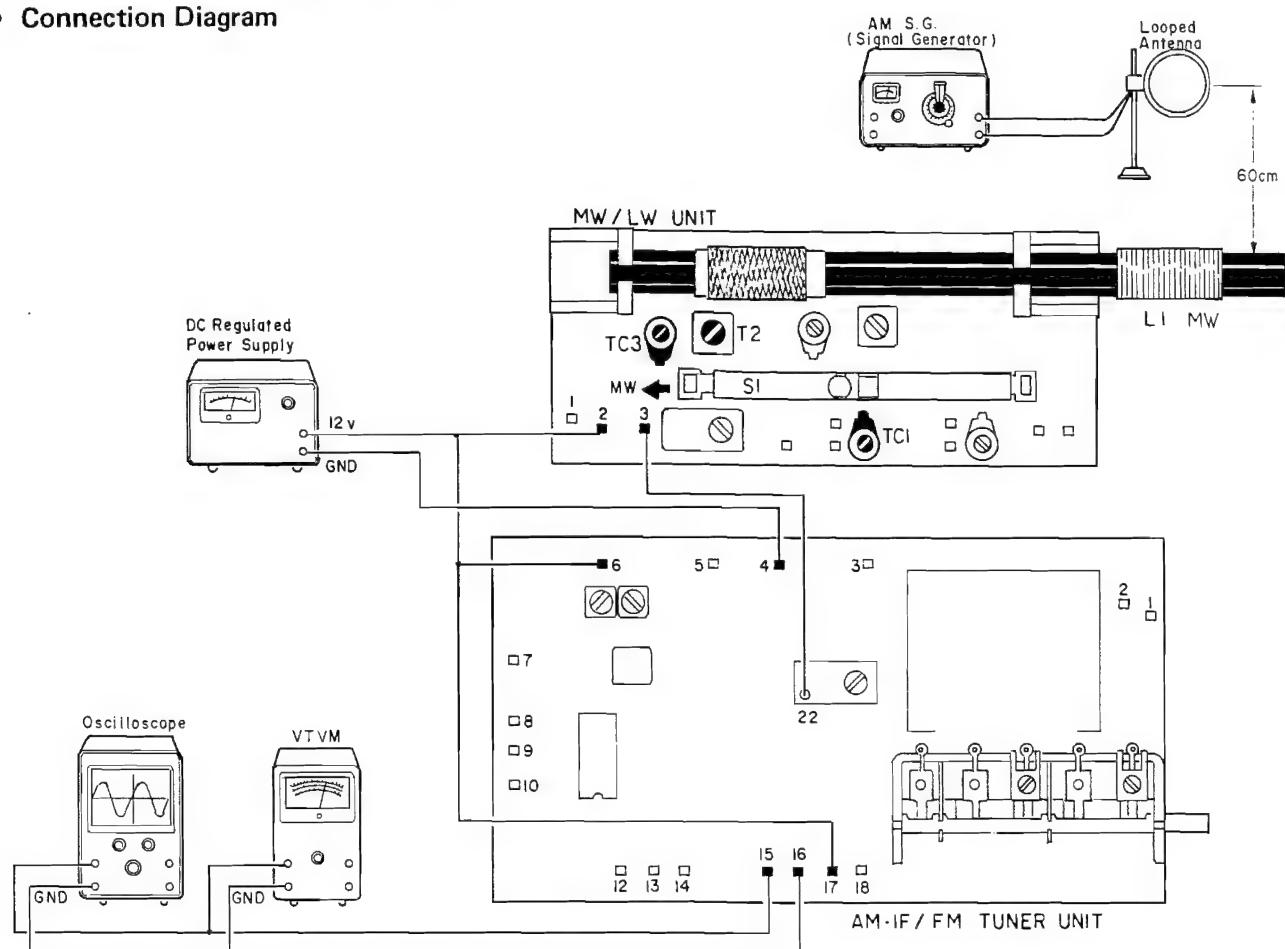


Fig. 18

- To Adjust

1. Select the MW/LW selector switch to MW position.
2. Set the variable capacitor at maximum capacity and apply a 510kHz signal from the signal generator (30% modulation at 400Hz). Adjust the oscillator coil T2 for maximum tuner output.
3. Set the variable capacitor at minimum capacity and apply a signal of 1,650kHz. Adjust trimmer capacitor TC3 for maximum tuner output.
4. Repeat procedures 2 and 3 to establish the band

width of 510 to 1,650kHz.

5. Apply a signal of 600kHz and tune the variable capacitor for maximum reception; peak the output by adjusting the position of the bar antenna coil.
6. Apply a signal of 1,400kHz and tune the variable capacitor for maximum reception; peak the output by adjustment of the trimmer capacitor TC1.
7. Repeat procedures 5 and 6 for optimum tracking at both ends.

S.G. frequency	Variable capacitor position	Adjustment point	Circuit section
510kHz	Maximum capacity	T2	OSC
1,650kHz	Minimum capacity	TC3	OSC
600kHz	Tuned position	Bar antenna	ANT
1,400kHz	Tuned position	TC1	ANT

## ADJUSTMENT

### 4.8 LW TRACKING ADJUSTMENT

- Connection Diagram

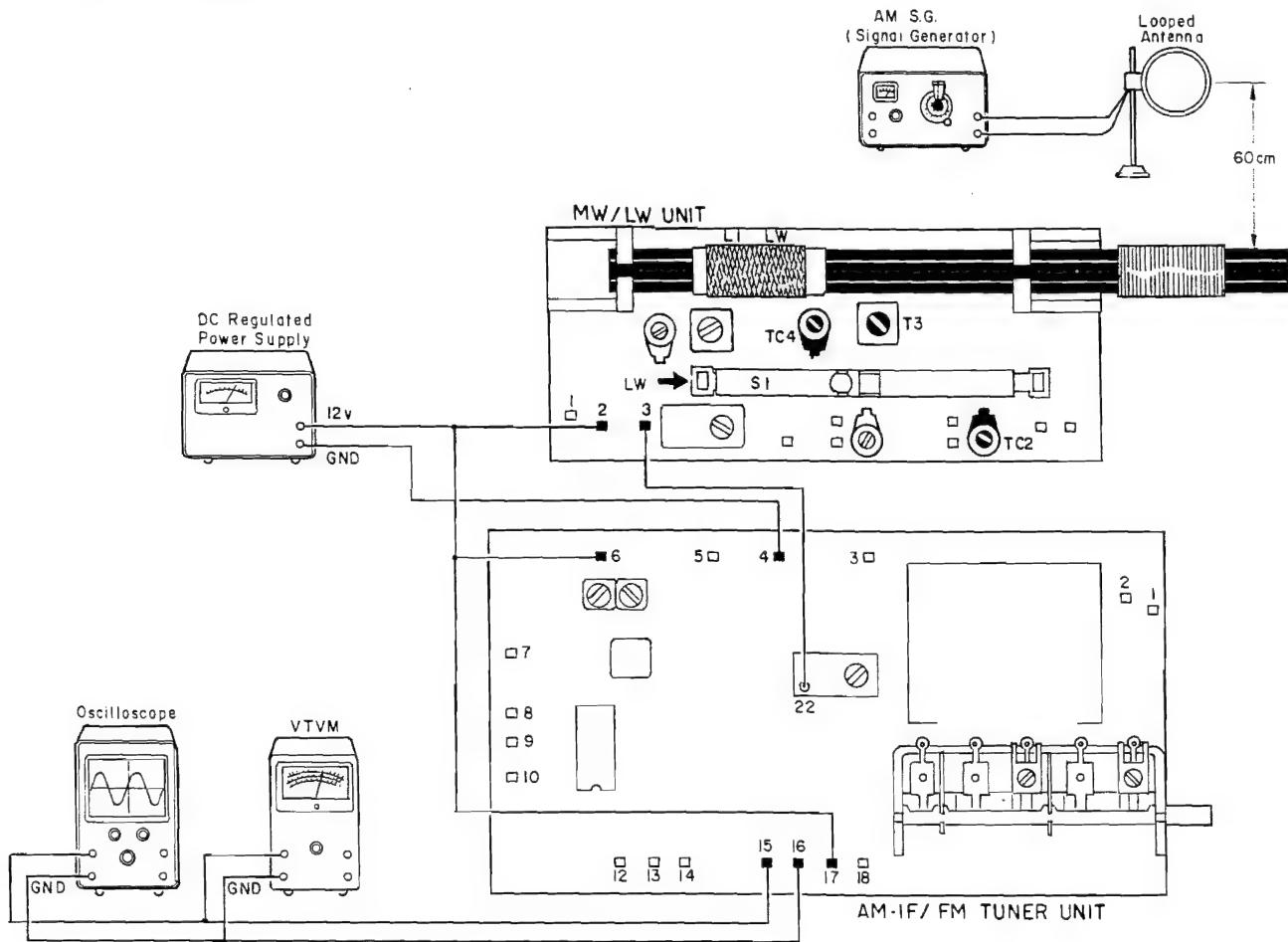


Fig. 19

- To Adjust

1. Select the MW/LW selector switch to LW position.
2. Set the variable capacitor at maximum capacity and apply a 140kHz signal from the signal generator (30% modulation at 400Hz). Adjust the oscillator coil T3 for maximum tuner output.
3. Set the variable capacitor at minimum capacitance and apply a signal of 370kHz. Adjust trimmer capacitor TC4 for maximum tuner output.
4. Repeat procedures 2 and 3 to establish the band

- width of 140 to 370kHz.
5. Apply a signal of 160kHz and tune the variable capacitor for maximum reception; peak the output by adjusting the position of the bar antenna coil.
6. Apply a signal of 340kHz and tune the variable capacitor for maximum reception; peak the output by adjustment of the trimmer capacitor TC3.
7. Repeat procedures 5 and 6 for optimum tracking at both ends.

S.G. frequency	Variable capacitor position	Adjustment point	Circuit section
140kHz	Maximum capacity	T3	OSC
370kHz	Minimum capacity	TC4	OSC
160kHz	Tuned position	LW Bar antenna	ANT
340kHz	Tuned position	TC3	ANT

#### 4.9 DRIVE CAM UNIT ADJUSTMENT

As shown in Fig. 20, adjust the drive cam unit so the center of its nontoothed part intersects the line from the center shaft to the drive cam center. Adjust by turning the hex nut a little at a time.

NOTE: It is not necessary to loosen the screw in the center of the hex nut.

#### 4.10 SIGNAL BAR ADJUSTMENT

Adjust when the tonearm auto-return does not operate or the tonearm return is too rapid. Adjust so the signal bar begins to push plate 1 when the tonearm is at a point 64 mm from the center shaft.

Turn the screw in the (↖) direction when plate 1 is pushed too soon. Turn the screw in the (↗) direction when plate 1 is pushed too late.

#### 4.11 SWITCH CAM ADJUSTMENT

Adjust so the turntable starts to rotate when the tonearm is near the outer edge of the turntable.

If the following incorrect movements (items A, B, C, D) are found, move the switch cam in the arrow-indicated direction such as to A↑, B←, C→, and D↓, according to the respective item to be adjusted.

A↑: When the tonearm is operating and the switch cam and switch lever are not contacting.

B←: When the tonearm is too far from the right position toward the center when the turntable starts rotating.

C→: When the tonearm is too far from the right position toward the outside edge when the turntable starts rotating.

D↓: When the switch cam and switch lever are contacting but the arm movement is not smooth.

Try to move the switch cam in various ways to find out right position if there are two more incorrect movements.

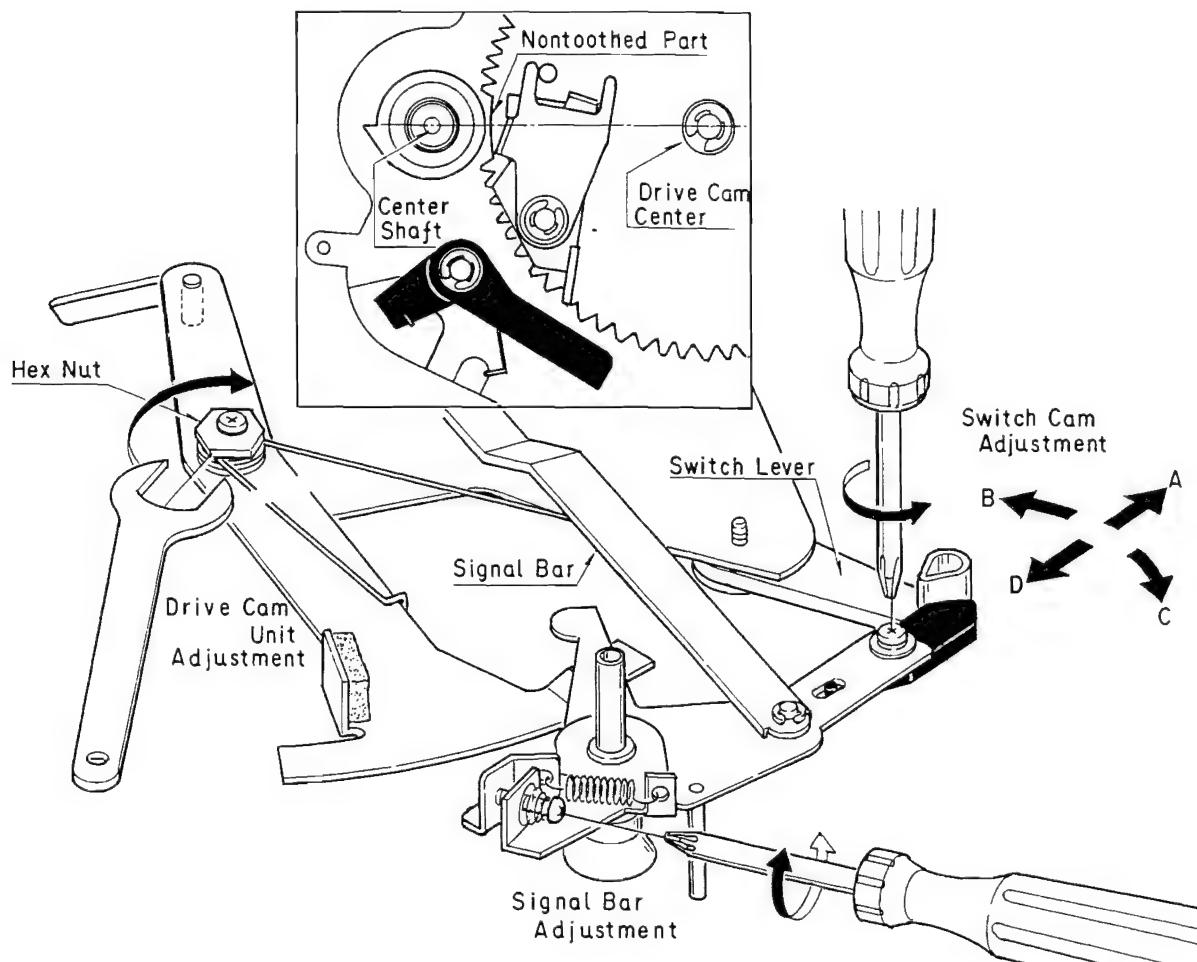


Fig. 20

## 5. DIAL STRINGING

NOTICE: Before dial string, set the tuning shaft fully counter-clockwise (low frequency).

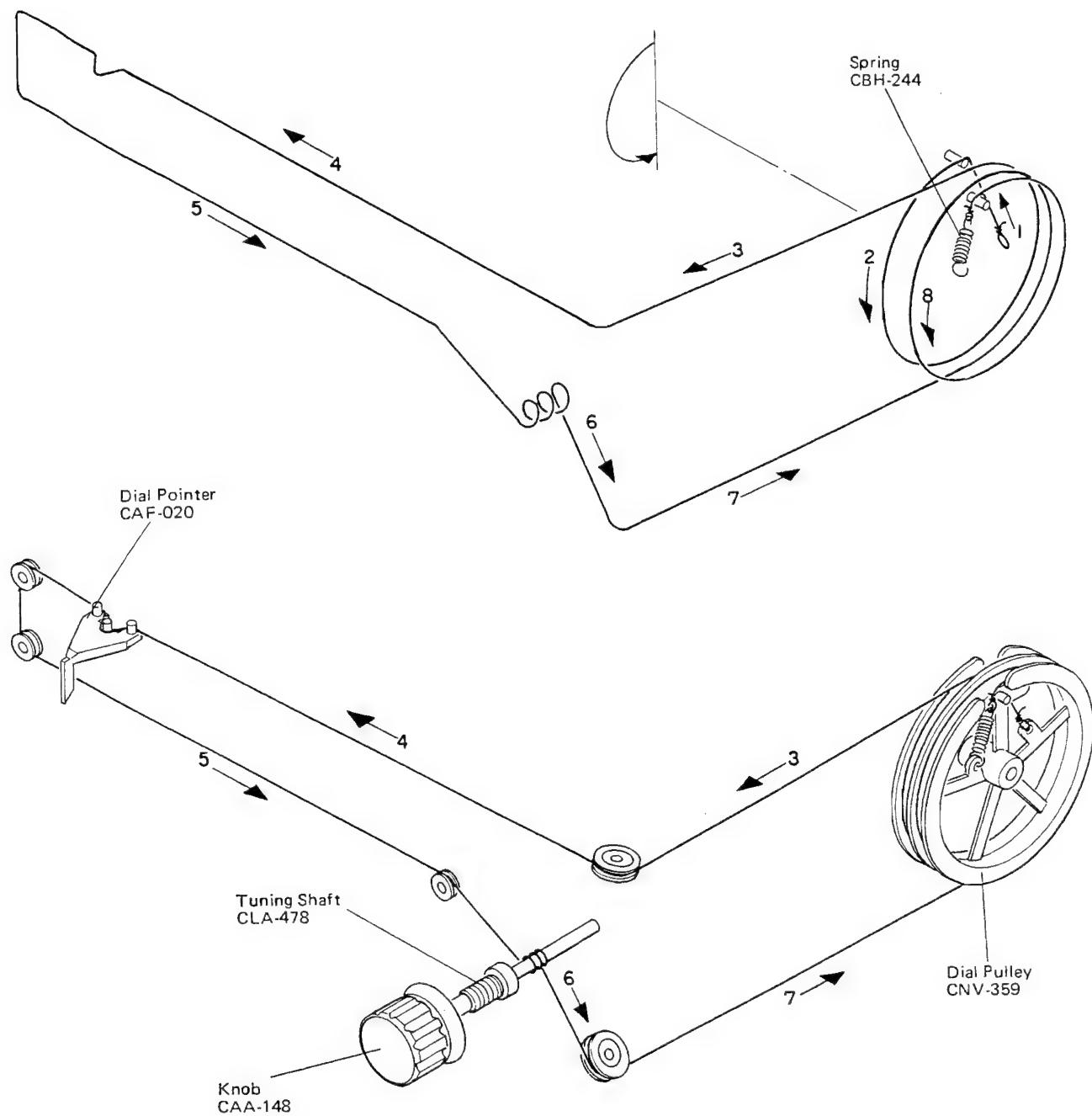
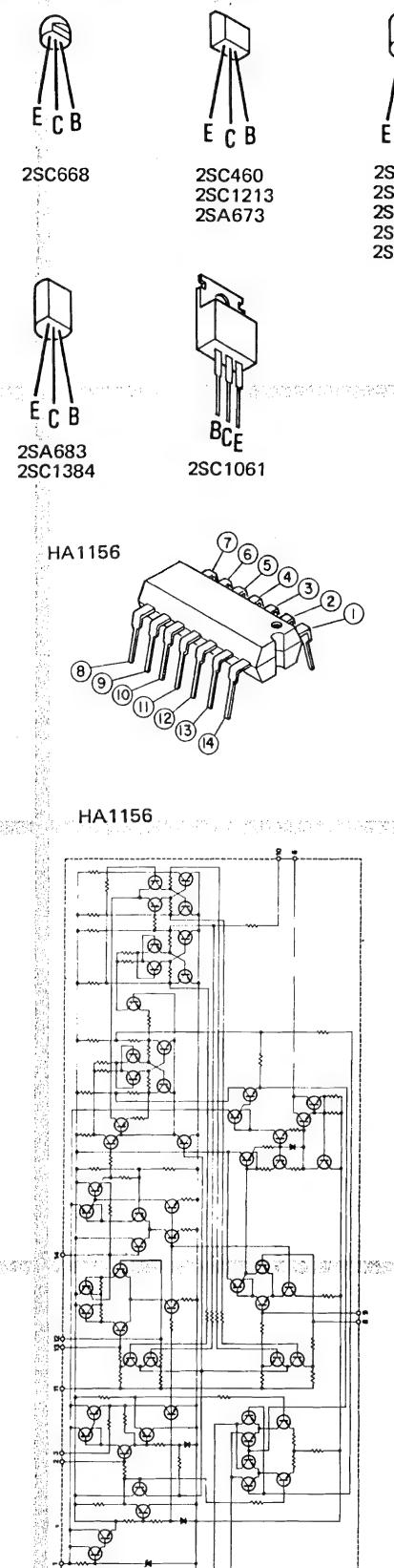
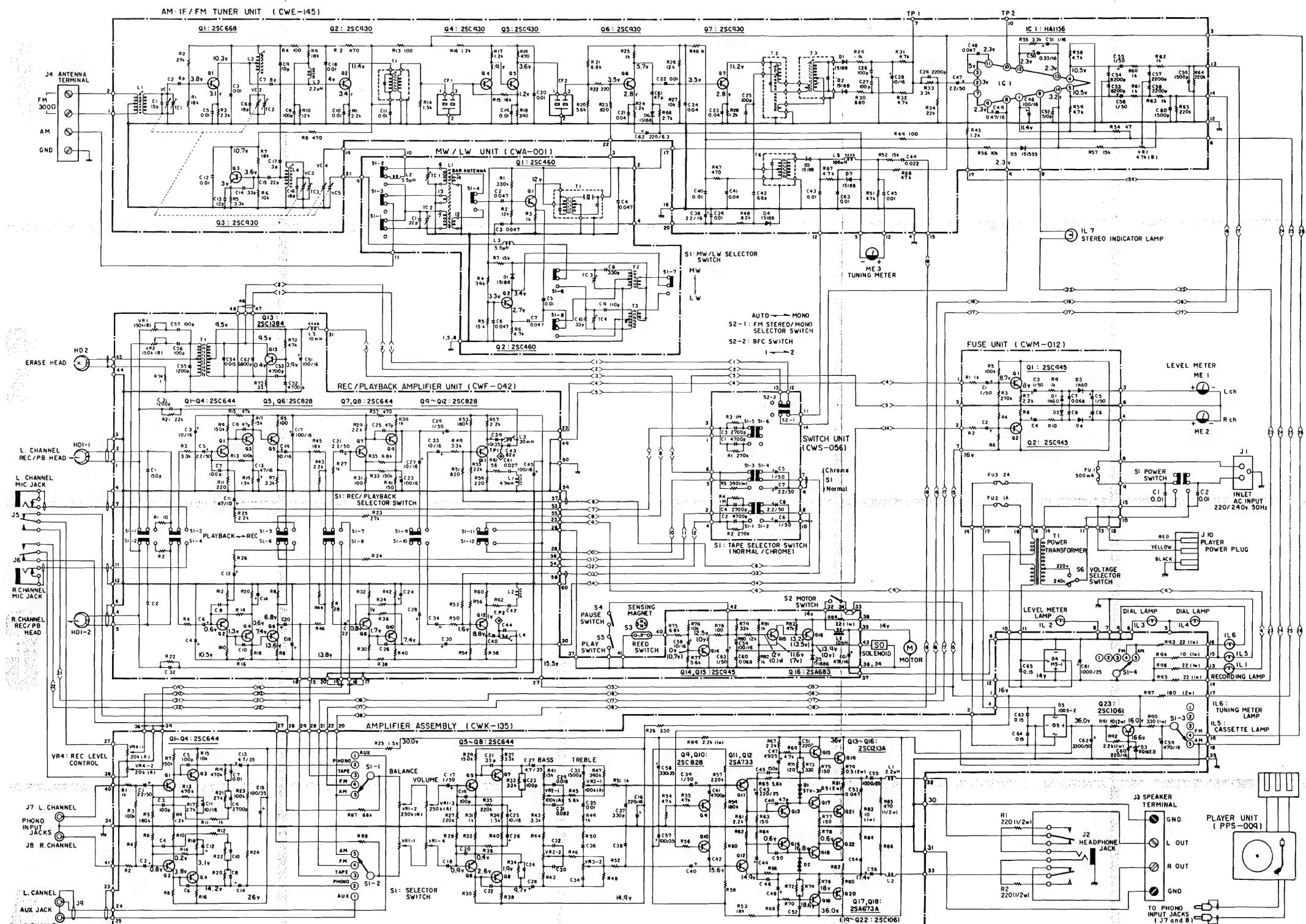


Fig. 21

## 6. SCHEMATIC CIRCUIT DIAGRAM

KH-3500



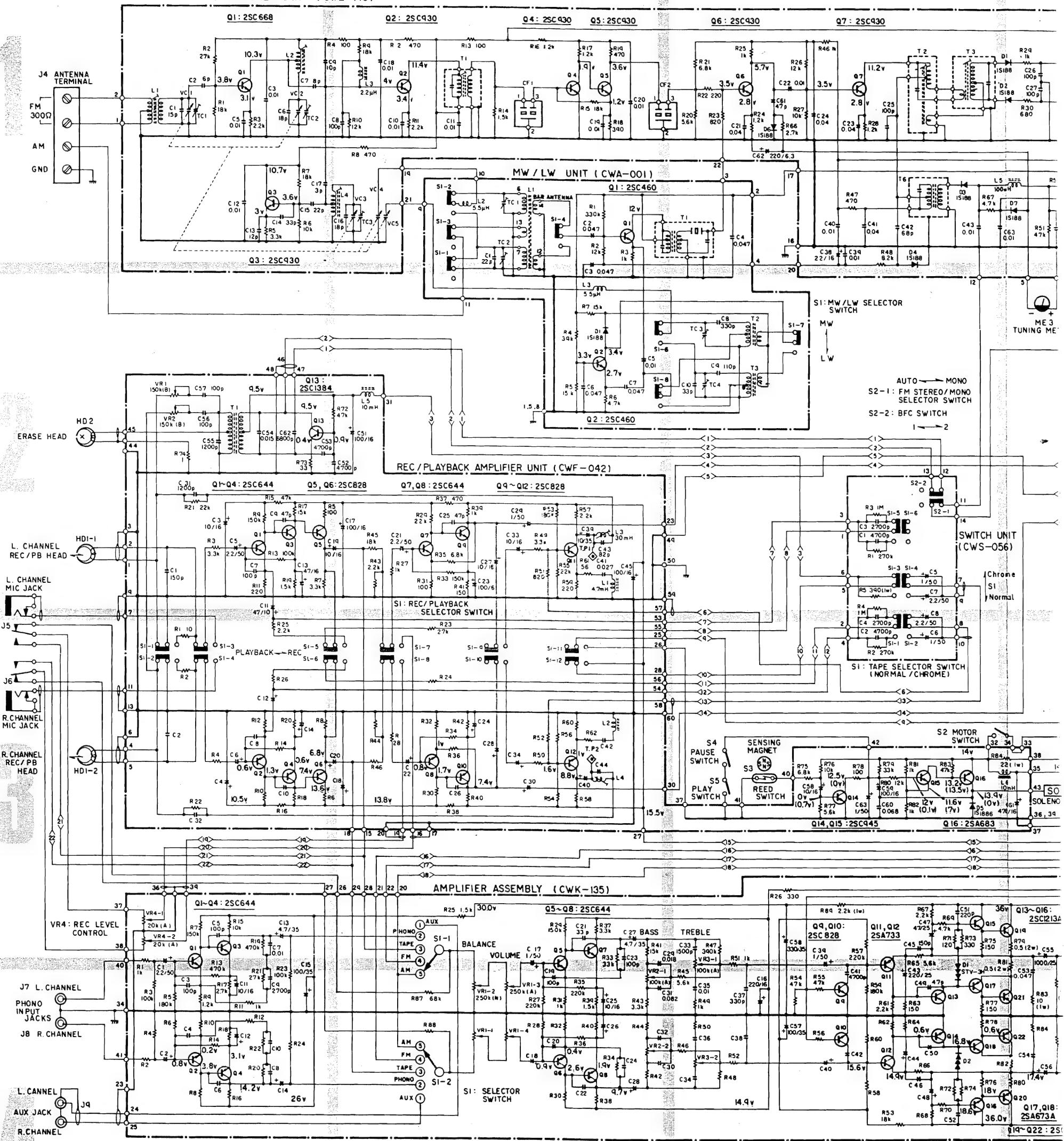
## 6. SCHEMATIC CIRCUIT DIAGRAM

A

B

C

AM - IF / FM TUNER UNIT (CWE-145)



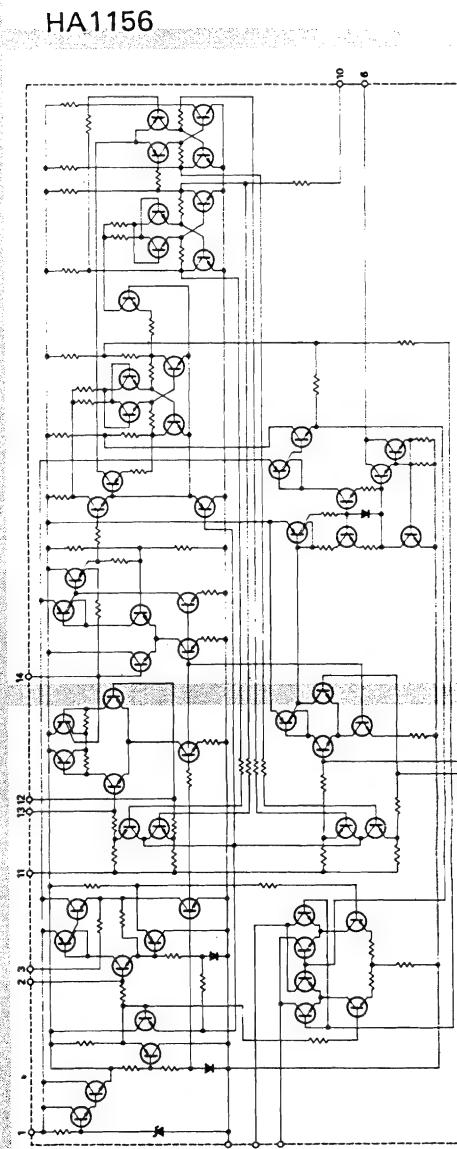
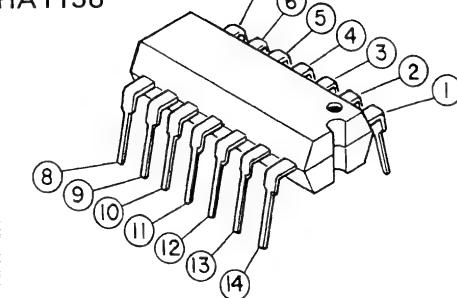
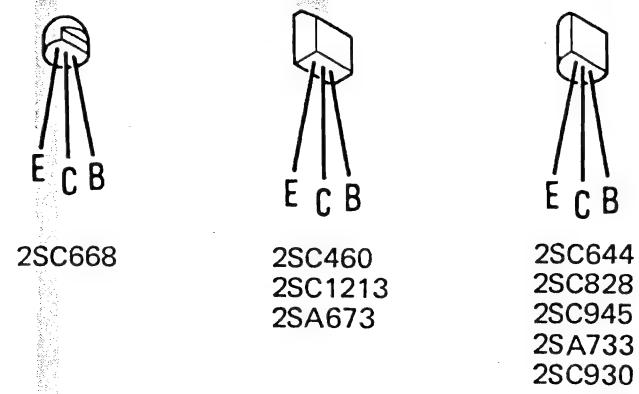
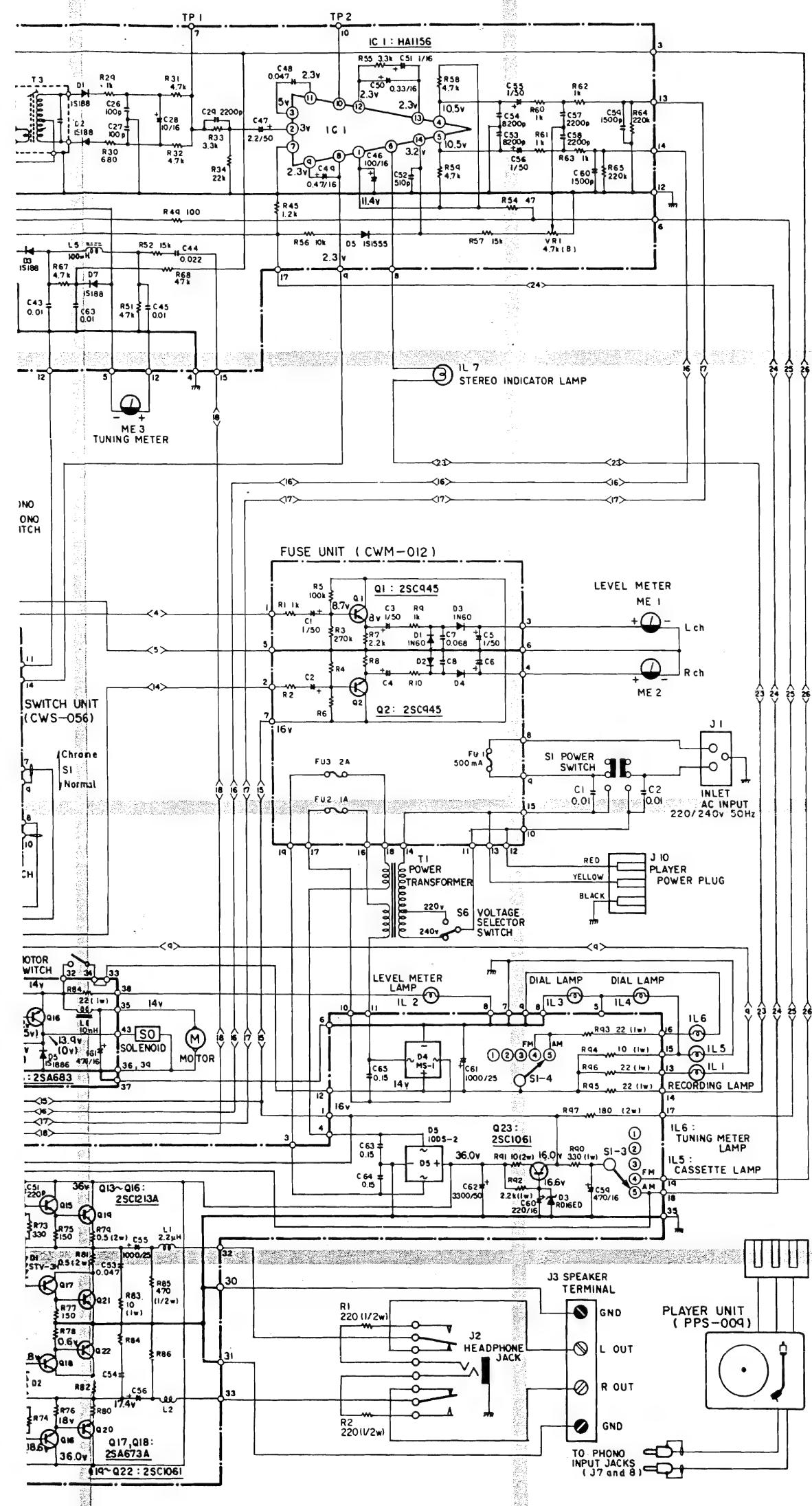


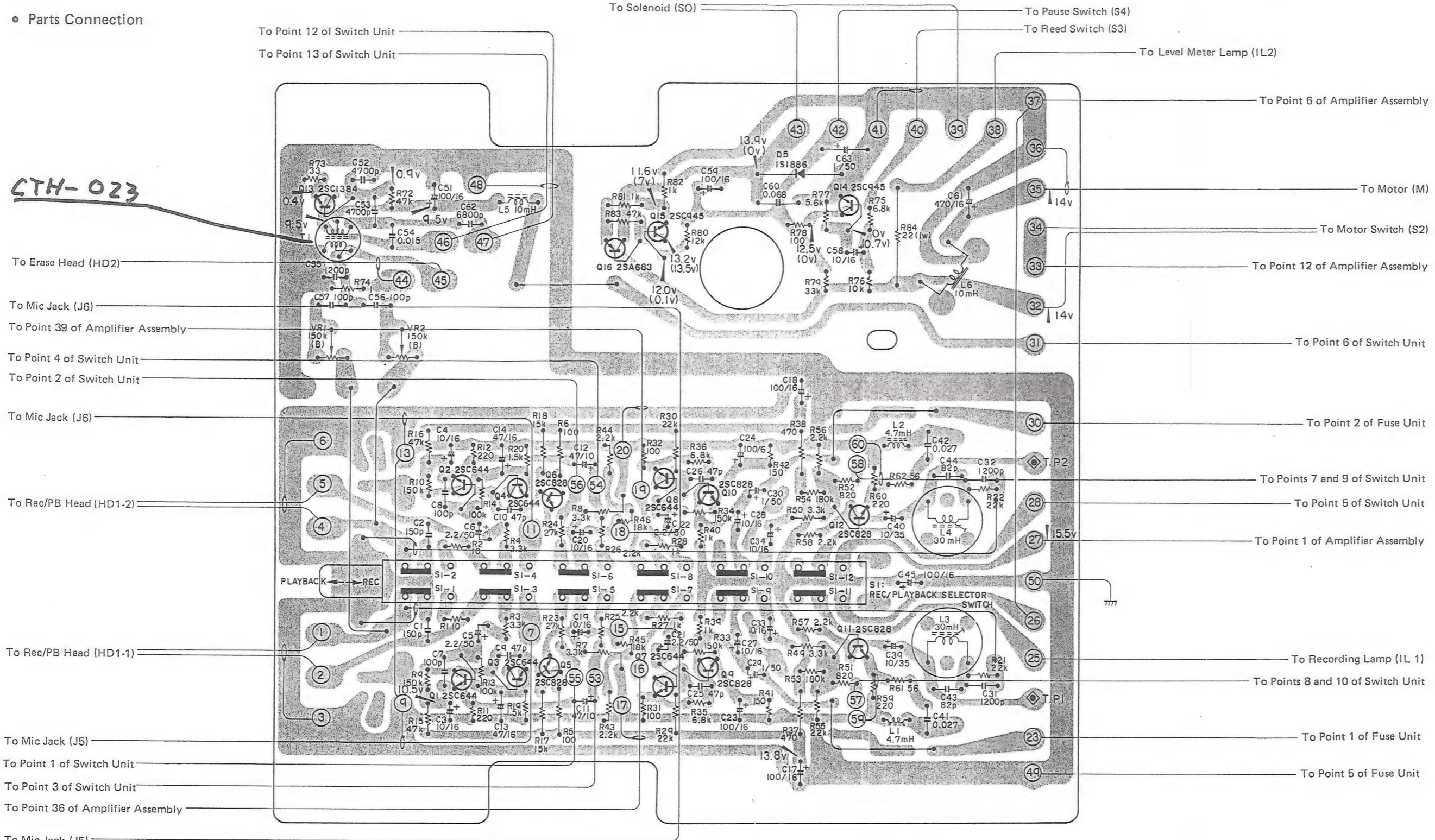
Fig. 22

## 7. REC/PB AMP UNIT (CWF-042)

KH-3500

REC/PB AMP UNIT (CWF-042)

### Parts Connection



Q1: 2SC644	Q3: 2SC644	Q5: 2SC828	Q7: 2SC644	Q9: 2SC828	Q11: 2SC828
C 1.3v 0.6v	C 7.4v 1.3v 0.6v	C 13.6v 7.4v 6.8v	C 1.7v 0.8v 1v	C 7.4v 1.7v	C 8.8v 1.6v 1v

Fig. 23

- Parts List

NOTICE: Of the descriptive symbols of the resistor and capacitor, the encircled alphabetic letter denotes the allowable error.

Example: RD1/4VS100 (J) C:  $\pm 0.25\text{pF}$  F:  $\pm 1\text{pF}$  J:  $\pm 5\%$  M:  $\pm 20\%$  Z:  $\begin{smallmatrix} +80\% \\ -20 \end{smallmatrix}$   
 CEA100 (P) 25 D:  $\pm 0.5\text{pF}$  G:  $\pm 2\%$  K:  $\pm 10\%$  X:  $\begin{smallmatrix} +40\% \\ -20 \end{smallmatrix}$  P:  $\begin{smallmatrix} +100\% \\ -10 \end{smallmatrix}$

## MISCELLANEOUS

Ref. Key	Parts No.	Description	Notes
Q1	G05-035-D, E	Transistor, 2SC644-R, S	
Q2	G05-035-D, E	Transistor, 2SC644-R, S	
Q3	G05-035-D, E	Transistor, 2SC644-R, S	
Q4	G05-035-D, E	Transistor, 2SC644-R, S	
Q5	G05-061-D, E	Transistor, 2SC828-R, S	
Q6	G05-061-D, E	Transistor, 2SC828-R, S	
Q7	G05-035-D, E	Transistor, 2SC644-R, S	
Q8	G05-035-D, E	Transistor, 2SC644-R, S	
Q9	G05-061-D, E	Transistor, 2SC828-R, S	
Q10	G05-061-D, E	Transistor, 2SC828-R, S	
Q11	G05-061-D, E	Transistor, 2SC828-R, S	
Q12	G05-061-D, E	Transistor, 2SC828-R, S	
Q13	G05-418-C, D	Transistor, 2SC1384-R, S	
Q14	G05-044-B, C	Transistor, 2SC945-Q, R	
Q15	G05-044-B, C	Transistor, 2SC945-Q, R	
Q16	G03-404-C D	Transistor, 2SA683-R, S	
S1	CSH-029	Switch	
L1	CTF-049	Coil, 4.7mH	
L2	CTF-049	Coil, 4.7mH	
L3	CTH014	Coil, 30mH	
L4	CTH-014	Coil, 30mH	
L5	CTF-029	Ferri-inductor, 10mH	
L6	CTH-015	Coil, 10mH	
VR1	CCP-024	Volume	
VR2	CCP-024	Volume	
D5	G00-551-A	Diode, 1S1886	

T1 CTH-023 Top Coil

REC/PB AMP UNIT (CWF-042)

RESISTORS

Ref. Key	Parts No.	Description			Ref. Key	Parts No.	Description		
R1	RD1/4VS100J	Resistor	10Ω	1/4W	R41	RD1/4VS151J	Resistor	150Ω	1/4W
R2	RD1/4VS100J	Resistor	10Ω	1/4W	R42	RD1/4VS151J	Resistor	150Ω	1/4W
R3	RD1/4VS332J	Resistor	3.3kΩ	1/4W	R43	RD1/4VS222J	Resistor	2.2kΩ	1/4W
R4	RD1/4VS332J	Resistor	3.3kΩ	1/4W	R44	RD1/4VS222J	Resistor	2.2kΩ	1/4W
R5	RD1/4VS101J	Resistor	100Ω	1/4W	R45	RD1/4VS183J	Resistor	18kΩ	1/4W
R6	RD1/4VS101J	Resistor	100Ω	1/4W	R46	RD1/4VS183J	Resistor	18kΩ	1/4W
R7	RD1/4VS332J	Resistor	3.3kΩ	1/4W	R49	RD1/4VS332J	Resistor	3.3kΩ	1/4W
R8	RD1/4VS332J	Resistor	3.3kΩ	1/4W	R50	RD1/4VS332J	Resistor	3.3kΩ	1/4W
R9	RD1/4VS154JNL	Resistor	150kΩ	1/4W	R51	RD1/4VS821J	Resistor	820Ω	1/4W
R10	RD1/4VS154JNL	Resistor	150kΩ	1/4W	R52	RD1/4VS821J	Resistor	820Ω	1/4W
R11	RD1/4VS221J	Resistor	220Ω	1/4W	R53	RD1/4VS184J	Resistor	180kΩ	1/4W
R12	RD1/4VS221J	Resistor	220Ω	1/4W	R54	RD1/4VS184J	Resistor	180kΩ	1/4W
R13	RD1/4VS104JNL	Resistor	100kΩ	1/4W	R55	RD1/4VS223J	Resistor	22kΩ	1/4W
R14	RD1/4VS104JNL	Resistor	100kΩ	1/4W	R56	RD1/4VS223J	Resistor	22kΩ	1/4W
R15	RD1/4VS473J	Resistor	47kΩ	1/4W	R57	RD1/4VS222J	Resistor	2.2kΩ	1/4W
R16	RD1/4VS473J	Resistor	47kΩ	1/4W	R58	RD1/4VS222J	Resistor	2.2kΩ	1/4W
R17	RD1/4VS153J	Resistor	15kΩ	1/4W	R59	RD1/4VS221J	Resistor	220Ω	1/4W
R18	RD1/4VS153J	Resistor	15kΩ	1/4W	R60	RD1/4VS221J	Resistor	220Ω	1/4W
R19	RD1/4VS152J	Resistor	1.5kΩ	1/4W	R61	RD1/4VS560J	Resistor	56Ω	1/4W
R20	RD1/4VS152J	Resistor	1.5kΩ	1/4W	R62	RD1/4VS560J	Resistor	56Ω	1/4W
R21	RD1/4VS223J	Resistor	22kΩ	1/4W	R72	RD1/4VS473J	Resistor	47kΩ	1/4W
R22	RD1/4VS223J	Resistor	22kΩ	1/4W	R73	RD1/4VS330J	Resistor	33Ω	1/4W
R23	RD1/4VS273J	Resistor	27kΩ	1/4W	R74	RD1/4VS010J	Resistor	1Ω	1/4W
R24	RD1/4VS273J	Resistor	27kΩ	1/4W	R75	RD1/4VS682J	Resistor	6.8kΩ	1/4W
R25	RD1/4VS222J	Resistor	2.2kΩ	1/4W	R76	RD1/4VS103J	Resistor	10kΩ	1/4W
R26	RD1/4VS222J	Resistor	2.2kΩ	1/4W	R77	RD1/4VS562J	Resistor	5.6kΩ	1/4W
R27	RD1/4VS102J	Resistor	1kΩ	1/4W	R78	RD1/4VS101J	Resistor	100Ω	1/4W
R28	RD1/4VS102J	Resistor	1kΩ	1/4W	R79	RD1/4VS333J	Resistor	33kΩ	1/4W
R29	RD1/4VS223J	Resistor	22kΩ	1/4W	R80	RD1/4VS123J	Resistor	12kΩ	1/4W
R30	RD1/4VS223J	Resistor	22kΩ	1/4W	R81	RD1/4VS102J	Resistor	1kΩ	1/4W
R31	RD1/4VS101J	Resistor	100Ω	1/4W	R82	RD1/4VS102J	Resistor	1kΩ	1/4W
R32	RD1/4VS101J	Resistor	100Ω	1/4W	R83	RD1/4VS473J	Resistor	47kΩ	1/4W
R33	RD1/4VS154J	Resistor	150kΩ	1/4W	R84	RS1P220K	Resistor	22Ω	1W
R34	RD1/4VS154J	Resistor	150kΩ	1/4W					
R35	RD1/4VS682J	Resistor	6.8kΩ	1/4W					
R36	RD1/4VS682J	Resistor	6.8kΩ	1/4W					
R37	RD1/4VS471J	Resistor	470Ω	1/4W					
R38	RD1/4VS471J	Resistor	470Ω	1/4W					
R39	RD1/4VS102J	Resistor	1kΩ	1/4W					
R40	RD1/4VS102J	Resistor	1kΩ	1/4W					

## CAPACITORS

Ref. Key	Parts No.	Description	Ref. Key	Parts No.	Description
C1	CKDYB151K50	Capacitor 150pF 50V	C28	CEA100P16	Capacitor 10μF 16V
C2	CKDYB151K50	Capacitor 150pF 50V	C29	CEA010P50	Capacitor 1μF 50V
C3	CEA100P16	Capacitor 10μF 16V	C30	CEA010P50	Capacitor 1μF 50V
C4	CEA100P16	Capacitor 10μF 16V	C31	CQMA122K50	Capacitor 1200pF 50V
C5	CEA2R2P50	Capacitor 2.2μF 50V	C32	CQMA122K50	Capacitor 1200pF 50V
C6	CEA2R2P50	Capacitor 2.2μF 50V	C33	CEA100P16	Capacitor 10μF 16V
C7	CKDYB101K50	Capacitor 100pF 50V	C34	CEA100P16	Capacitor 10μF 16V
C8	CKDYB101K50	Capacitor 100pF 50V	C39	CEA100P35	Capacitor 10μF 35V
C9	CCDSL470K50	Capacitor 47pF 50V	C40	CEA100P35	Capacitor 10μF 35V
C10	CCDSL470K50	Capacitor 47pF 50V	C41	CQMA273K50	Capacitor 0.027μF 50V
C11	CEA470P10	Capacitor 47μF 10V	C42	CQMA273K50	Capacitor 0.027μF 50V
C12	CEA470P10	Capacitor 47μF 10V	C43	CCDSL820K50	Capacitor 82pF 50V
C13	CEA470P16	Capacitor 47μF 16V	C44	CCDSL820K50	Capacitor 82pF 50V
C14	CEA470P16	Capacitor 47μF 16V	C45	CEA101P16	Capacitor 100μF 16V
C17	CEA101P16	Capacitor 100μF 16V	C51	CEA101P16	Capacitor 100μF 16V
C18	CEA101P16	Capacitor 100μF 16V	C52	CQMA472K50	Capacitor 4700pF 50V
C19	CEA100P16	Capacitor 10μF 16V	C53	CQMA472K50	Capacitor 4700pF 50V
C20	CEA100P16	Capacitor 10μF 16V	C54	CQMA153K50	Capacitor 0.015μF 50V
C21	CEA2R2P50	Capacitor 2.2μF 50V	C55	CQSA122K50	Capacitor 1200pF 50V
C22	CEA2R2P50	Capacitor 2.2μF 50V	C56	CKDYB101K50	Capacitor 100pF 50V
C23	CEA101P6	Capacitor 100μF 6V	C57	CKDYB101K50	Capacitor 100pF 50V
C24	CEA101P6	Capacitor 100μF 6V	C58	CEA100P16	Capacitor 10μF 16V
C25	CCDSL470K50	Capacitor 47pF 50V	C59	CEA101P16	Capacitor 100μF 16V
C26	CCDSL470K50	Capacitor 47pF 50V	C60	CQMA683K50	Capacitor 0.068μF 50V
C27	CEA100P16	Capacitor 10μF 16V	C61	CEA471P16	Capacitor 470μF 16V
			C62	CQMA682K50	Capacitor 6800pF 50V
			C63	CEA010P50	Capacitor 1μF 50V

## 8. SWITCH UNIT (CWS-056)

## ● Parts Connection

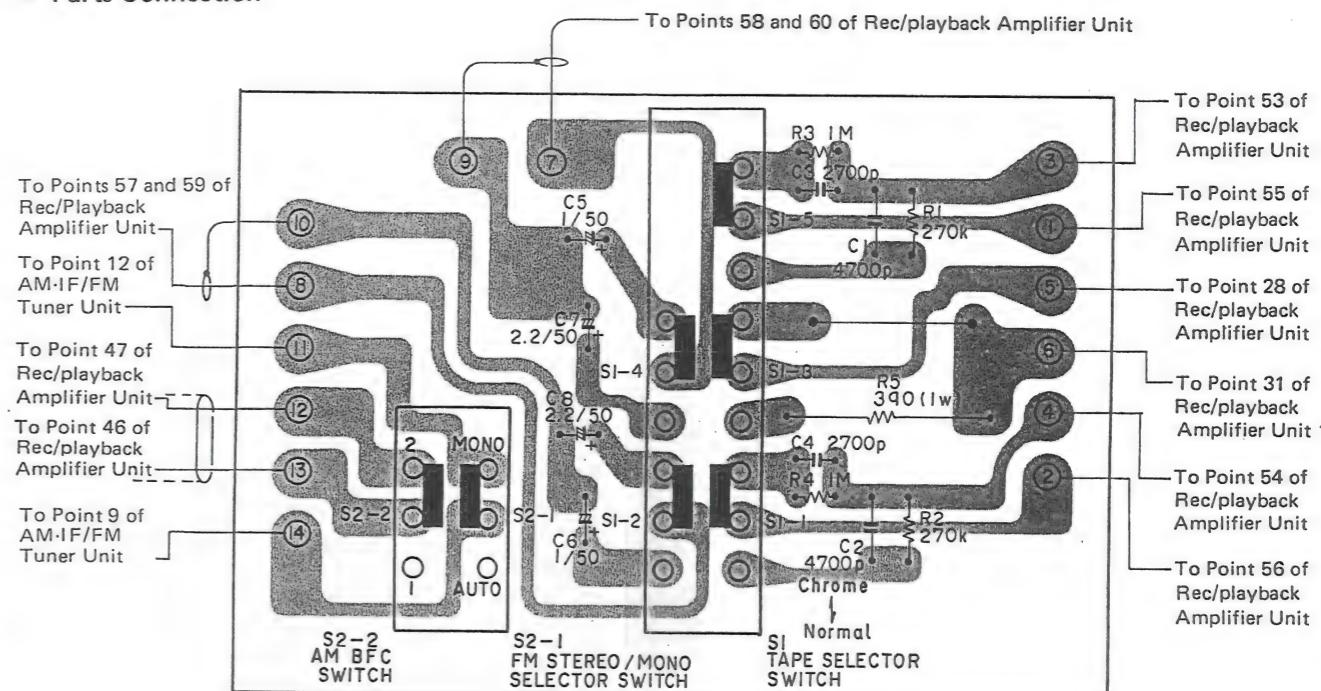


Fig. 24

## ● Parts List

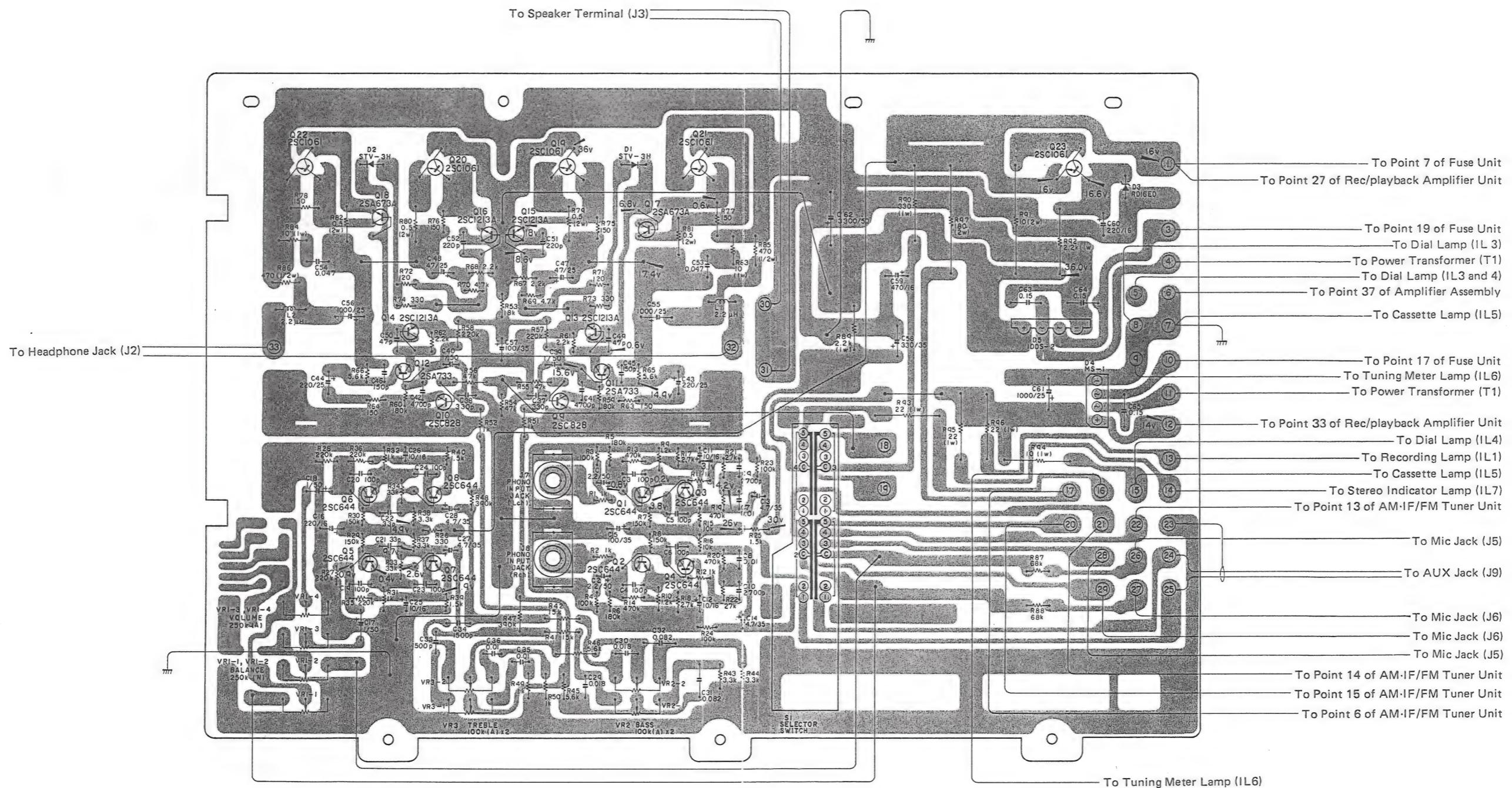
Ref. Key	Parts No.	Description	Notes
S1	CSG-063	Push Switch	Tape Selector
S2	CSG-063	Push Switch	ST/Mono, AM BFC
R1	RD1/4VS274J	Resistor, 270kΩ 1/4W	
R2	RD1/4VS274J	Resistor, 270kΩ 1/4W	
R3	RD1/4VS105J	Resistor, 1MΩ 1/4W	
R4	RD1/4VS105J	Resistor, 1MΩ 1/4W	
R5	RS1P391K	Resistor, 390Ω 1W	
C1	CQMA472K50	Capacitor, 4700pF 50V	
C2	CQMA472K50	Capacitor, 4700pF 50V	
C3	CQMA272K50	Capacitor, 2700pF 50V	
C4	CQMA272K50	Capacitor, 2700pF 50V	
C5	CEA010P50	Capacitor, 1μF 50V	
C6	CEA010P50	Capacitor, 1μF 50V	
C7	CEA2R2P50	Capacitor, 2.2μF 50V	
C8	CEA2R2P50	Capacitor, 2.2μF 50V	

## 9. AMPLIFIER ASSEMBLY (CWK-135)

KH-3500

AMPLIFIER ASSEMBLY (CWK-135)

### • Parts Connection



# AMPLIFIER ASSEMBLY (CWK-135) KH-3500

## ● Parts List

### MISCELLANEOUS

Ref. Key	Parts No.	Description	Notes
Q1	G05-035-D, E	Transistor, 2SC644-R, S	
Q2	G05-035-D, E	Transistor, 2SC644-R, S	
Q3	G05-035-D, E	Transistor, 2SC644-R, S	
Q4	G05-035-D, E	Transistor, 2SC644-R, S	
Q5	G05-035-D, E	Transistor, 2SC644-R, S	
Q6	G05-035-D, E	Transistor, 2SC644-R, S	
Q7	G05-035-D, E	Transistor, 2SC644-R, S	
Q8	G05-035-D, E	Transistor, 2SC644-R, S	
Q9	G05-061-C, D	Transistor, 2SC828-Q, R	
Q10	G05-061-C, D	Transistor, 2SC828-Q, R	
Q11	G03-017-B, C	Transistor, 2SA733-Q, R	
Q12	G03-017-B, C	Transistor, 2SA733-Q, R	
Q13	G05-056-B, C	Transistor, 2SC1213A-B, C	
Q14	G05-056-B, C	Transistor, 2SC1213A-B, C	
Q15	G05-056-B, C	Transistor, 2SC1213A-B, C	
Q16	G05-056-B, C	Transistor, 2SC1213A-B, C	
Q17	G03-016-B, C	Transistor, 2SA673A-B, C	
Q18	G03-016-B, C	Transistor, 2SA673A-B, C	
Q19	G05-704-B, C	Transistor, 2SC1061-B, C	
Q20	G05-704-B, C	Transistor, 2SC1061-B, C	
Q21	G05-704-B, C	Transistor, 2SC1061-B, C	
Q22	G05-704-B, C	Transistor, 2SC1061-B, C	
Q23	G05-704-B, C	Transistor, 2SC1061-B, C	
D1	G01-216-B, C	Diode, STV-3H-Y, G	
D2	G01-216-B, C	Diode, STV-3H-Y, G	
D3	G01-049-C	Diode, RD16ED	
D4	G01-806-A	Diode, MS-1	
D5	G00-557-B	Diode, 10DS-2	
L1	CTF-050	Choke Coil, 2.2μH	
L2	CTF-050	Choke Coil, 2.2μH	
S1	CSD-006	Switch	Selector
VR1	CCS-120	Volume	Balance, Volume
VR2	CCS-093	Volume	Bass
VR3	CCS-093	Volume	Treble
VR4	CCS-119	Volume	Rec Level

## AMPLIFIER ASSEMBLY (CWK-135)

### RESISTORS

Ref. Key	Parts No.	Description			Ref. Key	Parts No.	Description		
R1	RD1/4VS102J	Resistor	1kΩ	1/4W	R41	RD1/4VS153J	Resistor	15kΩ	1/4W
R2	RD1/4VS102J	Resistor	1kΩ	1/4W	R42	RD1/4VS153J	Resistor	15kΩ	1/4W
R3	RD1/4VS104J	Resistor	100kΩ	1/4W	R43	RD1/4VS332J	Resistor	3.3kΩ	1/4W
R4	RD1/4VS104J	Resistor	100kΩ	1/4W	R44	RD1/4VS332J	Resistor	3.3kΩ	1/4W
R5	RD1/4VS184J	Resistor	180kΩ	1/4W	R45	RD1/4VS562J	Resistor	5.6kΩ	1/4W
R6	RD1/4VS184J	Resistor	180kΩ	1/4W	R46	RD1/4VS562J	Resistor	5.6kΩ	1/4W
R7	RD1/4VS154J	Resistor	150kΩ	1/4W	R47	RD1/4VS394J	Resistor	390kΩ	1/4W
R8	RD1/4VS154J	Resistor	150kΩ	1/4W	R48	RD1/4VS394J	Resistor	390kΩ	1/4W
R9	RD1/4VS122J	Resistor	1.2kΩ	1/4W	R49	RD1/4VS102J	Resistor	1kΩ	1/4W
R10	RD1/4VS122J	Resistor	1.2kΩ	1/4W	R50	RD1/4VS102J	Resistor	1kΩ	1/4W
R11	RD1/4VS102J	Resistor	1kΩ	1/4W	R51	RD1/4VS102J	Resistor	1kΩ	1/4W
R12	RD1/4VS102J	Resistor	1kΩ	1/4W	R52	RD1/4VS102J	Resistor	1kΩ	1/4W
R13	RD1/4VS474J	Resistor	470kΩ	1/4W	R53	RD1/4VS183J	Resistor	18kΩ	1/4W
R14	RD1/4VS474J	Resistor	470kΩ	1/4W	R54	RD1/4VS473J	Resistor	47kΩ	1/4W
R15	RD1/4VS103J	Resistor	10kΩ	1/4W	R55	RD1/4VS473J	Resistor	47kΩ	1/4W
R16	RD1/4VS103J	Resistor	10kΩ	1/4W	R56	RD1/4VS473J	Resistor	47kΩ	1/4W
R17	RD1/4VS272J	Resistor	2.7kΩ	1/4W	R57	RD1/4VS224J	Resistor	220kΩ	1/4W
R18	RD1/4VS272J	Resistor	2.7kΩ	1/4W	R58	RD1/4VS224J	Resistor	220kΩ	1/4W
R19	RD1/4VS474J	Resistor	470kΩ	1/4W	R59	RD1/4VS184J	Resistor	180kΩ	1/4W
R20	RD1/4VS474J	Resistor	470kΩ	1/4W	R60	RD1/4VS184J	Resistor	184kΩ	1/4W
R21	RD1/4VS273J	Resistor	27kΩ	1/4W	R61	RD1/4VS222J	Resistor	2.2kΩ	1/4W
R22	RD1/4VS273J	Resistor	27kΩ	1/4W	R62	RD1/4VS222J	Resistor	2.2kΩ	1/4W
R23	RD1/4VS104J	Resistor	100kΩ	1/4W	R63	RD1/4VS151J	Resistor	150Ω	1/4W
R24	RD1/4VS104J	Resistor	100kΩ	1/4W	R64	RD1/4VS151J	Resistor	150Ω	1/4W
R25	RD1/4VS152J	Resistor	1.5kΩ	1/4W	R65	RD1/4VS562J	Resistor	5.6kΩ	1/4W
R26	RD1/4VS331J	Resistor	330Ω	1/4W	R66	RD1/4VS562J	Resistor	5.6kΩ	1/4W
R27	RD1/4VS224J	Resistor	220kΩ	1/4W	R67	RD1/4VS222J	Resistor	2.2kΩ	1/4W
R28	RD1/4VS224J	Resistor	220kΩ	1/4W	R68	RD1/4VS222J	Resistor	2.2kΩ	1/4W
R29	RD1/4VS154J	Resistor	150kΩ	1/4W	R69	RD1/4VS472J	Resistor	4.7kΩ	1/4W
R30	RD1/4VS154J	Resistor	150kΩ	1/4W	R70	RD1/4VS472J	Resistor	4.7kΩ	1/4W
R31	RD1/4VS102J	Resistor	1kΩ	1/4W	R71	RD1/4VS121J	Resistor	120Ω	1/4W
R32	RD1/4VS102J	Resistor	1kΩ	1/4W	R72	RD1/4VS121J	Resistor	120Ω	1/4W
R33	RD1/4VS333J	Resistor	33kΩ	1/4W	R73	RD1/4VS331J	Resistor	330Ω	1/4W
R34	RD1/4VS333J	Resistor	33kΩ	1/4W	R74	RD1/4VS331J	Resistor	330Ω	1/4W
R35	RD1/4VS224J	Resistor	220kΩ	1/4W	R75	RD1/4VS151J	Resistor	150Ω	1/4W
R36	RD1/4VS224J	Resistor	220kΩ	1/4W	R76	RD1/4VS151J	Resistor	150Ω	1/4W
R37	RD1/4VS332J	Resistor	3.3kΩ	1/4W	R77	RD1/4VS151J	Resistor	150Ω	1/4W
R38	RD1/4VS332J	Resistor	3.3kΩ	1/4W	R78	RD1/4VS151J	Resistor	150Ω	1/4W
R39	RD1/4VS152J	Resistor	1.5kΩ	1/4W	R79	RN2P0R5K	Resistor	0.5Ω	2W
R40	RD1/4VS152J	Resistor	1.5kΩ	1/4W	R80	RN2P0R5K	Resistor	0.5Ω	2W

AMPLIFIER ASSEMBLY (CWK-135) KH-3500

Ref. Key	Parts No.	Description		
R81	RN2P0R5K	Resistor	0.5Ω	2W
R82	RN2P0R5K	Resistor	0.5Ω	2W
R83	RS1P100K	Resistor	10Ω	1W
R84	RS1P100K	Resistor	10Ω	1W
R85	RD½PS471J	Resistor	470Ω	½W
R86	RD½PS471J	Resistor	470Ω	½W
R87	RD¼VS683J	Resistor	68kΩ	¼W
R88	RD¼VS683J	Resistor	68kΩ	¼W
R89	RS1P222K	Resistor	2.2kΩ	1W
R90	RS1P331K	Resistor	330Ω	1W

Ref. Key	Parts No.	Description		
R91	RN2P100K	Resistor	10Ω	2W
R92	RS1P222K	Resistor	2.2kΩ	1W
R93	RS1P220K	Resistor	22Ω	1W
R94	RS1P100K	Resistor	10Ω	1W
R95	RS1P220K	Resistor	22Ω	1W
R96	RS1P220K	Resistor	22Ω	1W
R97	RS2P181K	Resistor	180Ω	2W

CAPACITORS

Ref. Key	Parts No.	Description		
C1	CEA2R2P50	Capacitor	2.2μF	50V
C2	CEA2R2P50	Capacitor	2.2μF	50V
C3	CKDYB101K50	Capacitor	100pF	50V
C4	CKDYB101K50	Capacitor	100pF	50V
C5	CKDYB101K50	Capacitor	100pF	50V
C6	CKDYB101K50	Capacitor	100pF	50V
C7	CQMA103K50	Capacitor	0.01μF	50V
C8	CQMA103K50	Capacitor	0.01μF	50V
C9	CQMA272K50	Capacitor	2700pF	50V
C10	CQMA272K50	Capacitor	2700pF	50V
C11	CEA100P16	Capacitor	10μF	16V
C12	CEA100P16	Capacitor	10μF	16V
C13	CEA4R7P35	Capacitor	4.7μF	35V
C14	CEA4R7P35	Capacitor	4.7μF	35V
C15	CEA101P35	Capacitor	100μF	35V
C16	CEA221P16	Capacitor	220μF	16V
C17	CEA010P50	Capacitor	1μF	50V
C18	CEA010P50	Capacitor	1μF	50V
C19	CKDYB101K50	Capacitor	100pF	50V
C20	CKDYB101K50	Capacitor	100pF	50V
C21	CKDYB330K50	Capacitor	33pF	50V
C22	CKDYB330K50	Capacitor	33pF	50V
C23	CKDYB101K50	Capacitor	100pF	50V
C24	CKDYB101K50	Capacitor	100pF	50V
C25	CEA100P16	Capacitor	10μF	16V

Ref. Key	Parts No.	Description		
C26	CEA100P16	Capacitor	10μF	16V
C27	CEA4R7P35	Capacitor	4.7μF	35V
C28	CEA4R7P35	Capacitor	4.7μF	35V
C29	CQMA183K50	Capacitor	0.018μF	50V
C30	CQMA183K50	Capacitor	0.018μF	50V
C31	CQMA823K50	Capacitor	0.082μF	50V
C32	CQMA823K50	Capacitor	0.082μF	50V
C33	CQMA152K50	Capacitor	1500pF	50V
C34	CQMA152K50	Capacitor	1500pF	50V
C35	CQMA103K50	Capacitor	0.01μF	50V
C36	CQMA103K50	Capacitor	0.01μF	50V
C37	CKDYB331K50	Capacitor	330pF	50V
C38	CKDYB331K50	Capacitor	330pF	50V
C39	CEA010P50	Capacitor	1μF	50V
C40	CEA010P50	Capacitor	1μF	50V
C41	CQMA472K50	Capacitor	4700pF	50V
C42	CQMA472K50	Capacitor	4700pF	50V
C43	CEA221P25	Capacitor	220μF	25V
C44	CEA221P25	Capacitor	220μF	25V
C45	CKDYB151K50	Capacitor	150pF	50V
C46	CKDYB151K50	Capacitor	150pF	50V
C47	CEA470P25	Capacitor	47μF	25V
C48	CEA470P25	Capacitor	47μF	25V
C49	CKDYB470K50	Capacitor	47pF	50V
C50	CKDYB470K50	Capacitor	47pF	50V

## AMPLIFIER ASSEMBLY (CWK-135)

Ref. Key	Parts No.	Description				Ref. Key	Parts No.	Description			
C51	CKDYB221K50	Capacitor	220pF	50V		C61	CEA102P25	Capacitor	1000 $\mu$ F	25V	
C52	CKDYB221K50	Capacitor	220pF	50V		C62	CCH-025	Capacitor	3300 $\mu$ F	50V	
C53	CQMA473K50	Capacitor	0.047 $\mu$ F	50V		C63	CQMA154K50	Capacitor	0.15 $\mu$ F	50V	
C54	CQMA473K50	Capacitor	0.047 $\mu$ F	50V		C64	CQMA154K50	Capacitor	0.15 $\mu$ F	50V	
C55	CEA102P25	Capacitor	1000 $\mu$ F	25V		C65	CQMA154K50	Capacitor	0.15 $\mu$ F	50V	
C56	CEA102P25	Capacitor	1000 $\mu$ F	25V							
C57	CEA101P35	Capacitor	100 $\mu$ F	35V							
C58	CEA331P35	Capacitor	330 $\mu$ F	35V							
C59	CEA471P16	Capacitor	470 $\mu$ F	16V							
C60	CEA221P16	Capacitor	220 $\mu$ F	16V							

## 10. FUSE UNIT (CWM-012)

### • Parts List

Ref. Key	Parts No.	Description			Notes
Q1	G05-044-B, C	Transistor, 2SC945-Q, R			
Q2	G05-044-B, C	Transistor, 2SC945-Q, R			
D1	G00-003-A	Diode, 1N60			
D2	G00-003-A	Diode, 1N60			
D3	G00-003-A	Diode, 1N60			
D4	G00-003-A	Diode, 1N60			
R1	RD $\frac{1}{2}$ VS102J	Resistor, 1k $\Omega$	1/4W		
R2	RD $\frac{1}{2}$ VS102J	Resistor, 1k $\Omega$	1/4W		
R3	RD $\frac{1}{2}$ VS274J	Resistor, 270k $\Omega$	1/4W		
R4	RD $\frac{1}{2}$ VS274J	Resistor, 270k $\Omega$	1/4W		
R5	RD $\frac{1}{2}$ VS104J	Resistor, 100k $\Omega$	1/4W		
R6	RD $\frac{1}{2}$ VS104J	Resistor, 100k $\Omega$	1/4W		
R7	RD $\frac{1}{2}$ VS222J	Resistor, 2.2k $\Omega$	1/4W		
R8	RD $\frac{1}{2}$ VS222J	Resistor, 2.2k $\Omega$	1/4W		
R9	RD $\frac{1}{2}$ VS102J	Resistor, 1k $\Omega$	1/4W		
R10	RD $\frac{1}{2}$ VS102J	Resistor, 1k $\Omega$	1/4W		
C1	CEA010P50	Capacitor, 1 $\mu$ F	50V		
C2	CEA010P50	Capacitor, 1 $\mu$ F	50V		
C3	CEA010P50	Capacitor, 1 $\mu$ F	50V		
C4	CEA010P50	Capacitor, 1 $\mu$ F	50V		
C5	CEA010P50	Capacitor, 1 $\mu$ F	50V		
C6	CEA010P50	Capacitor, 1 $\mu$ F	50V		
C7	CQMA683K50	Capacitor, 0.068 $\mu$ F	50V		
C8	CQMA683K50	Capacitor, 0.068 $\mu$ F	50V		

## FUSE UNIT (CWM-012) KH-3500

Note: Fuses FU1~3 are not included in FUSE UNIT (CWM-012).  
Parts numbers of fuses are identified in the chassis exploded view on Page 40.

### • Parts Connection

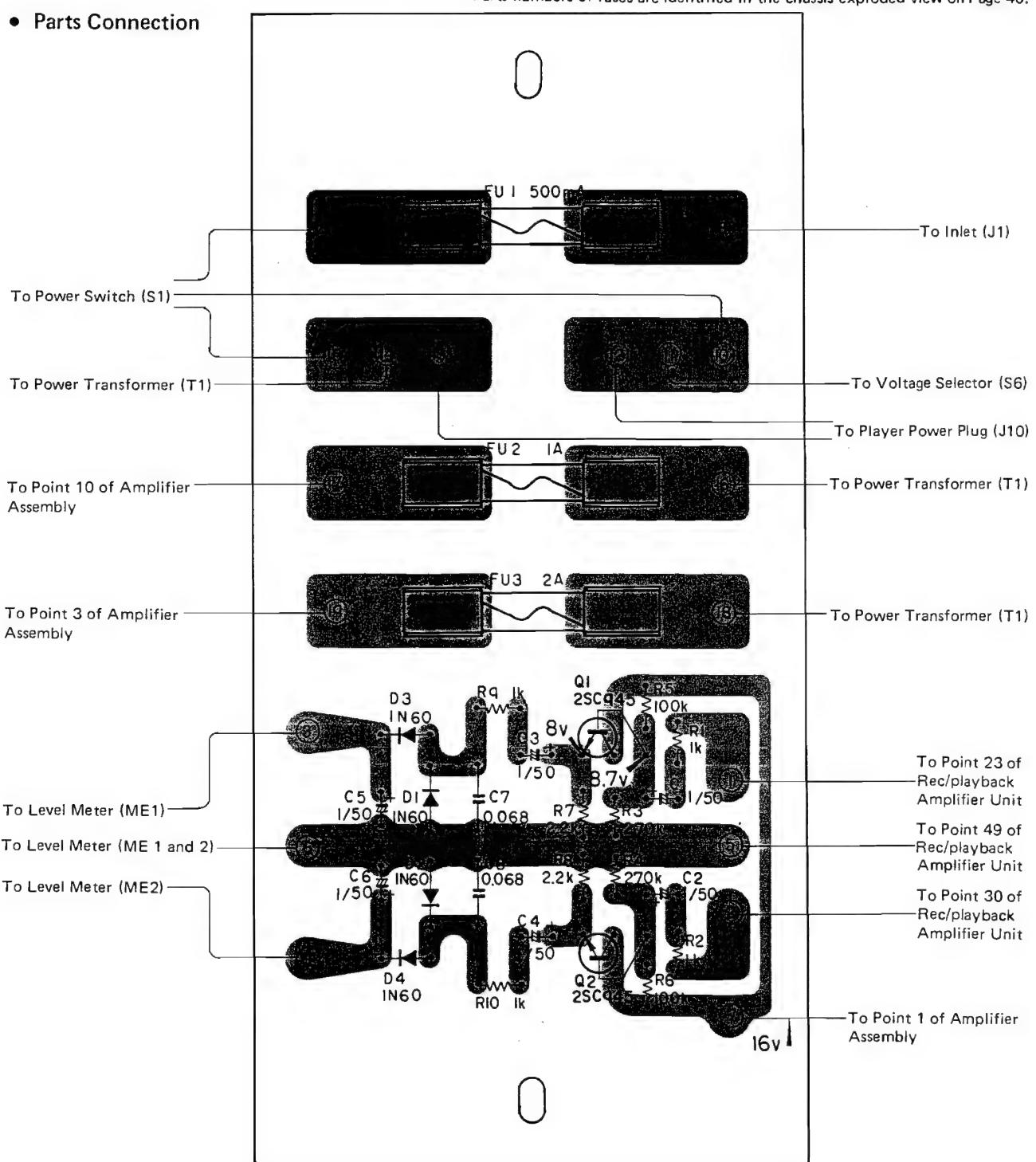


Fig. 26

## 11. MW/LW UNIT (CWA-001)

- Parts Connection

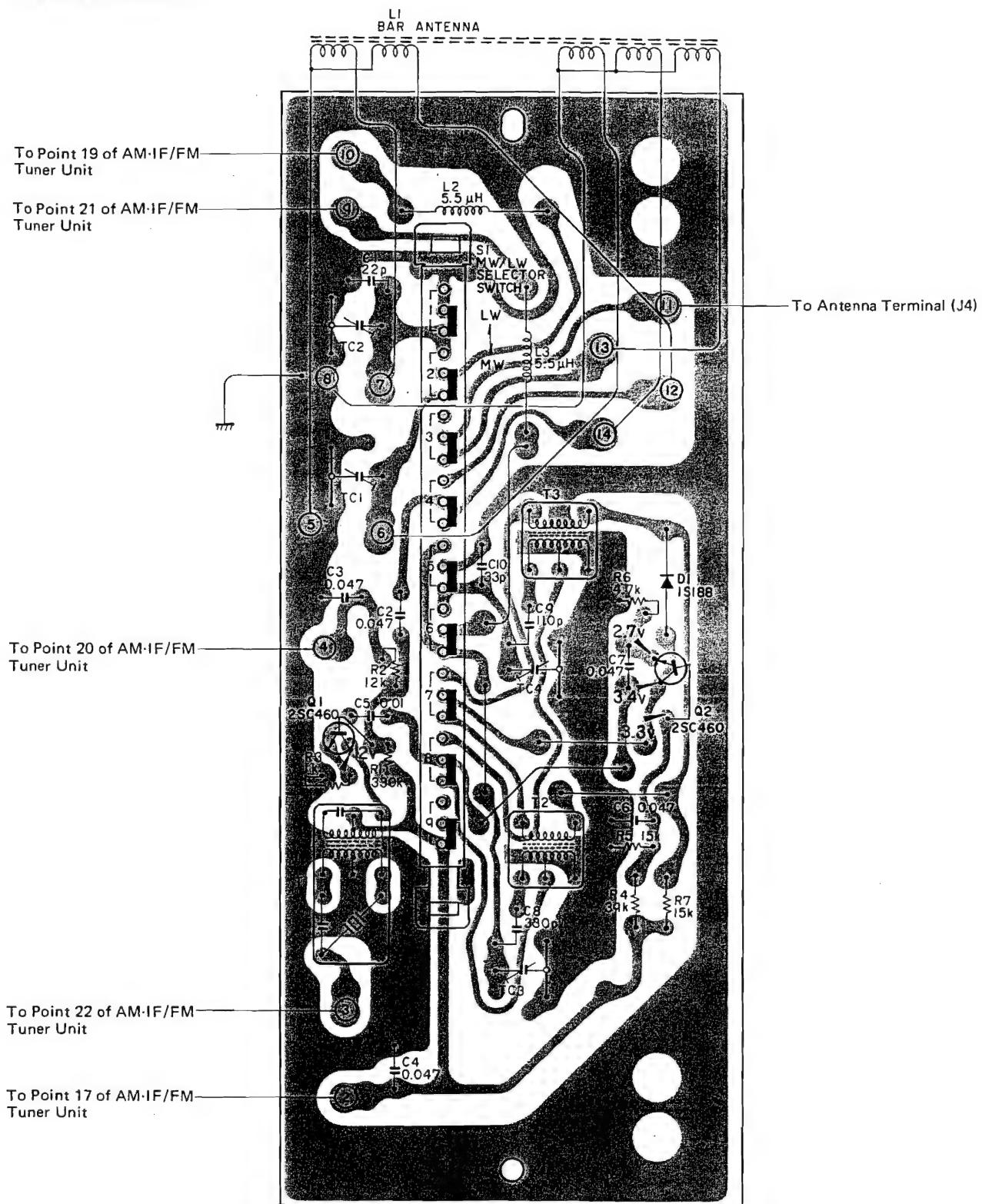


Fig. 27

## ● Parts List

## MISCELLANEOUS

Ref. Key	Parts No.	Description	Notes
Q1	G05-003-B	Transistor, 2SC460-B	
Q2	G05-003-B	Transistor, 2SC460-B	
D1	G00-004-A	Diode, 1S188	
S1	CSH-035	Slide Switch	MW/LW Select
T1	CTE-009	IF Transformer	
T2	CTB-029	Coil	
T3	CTD-001	Coil	
L1	CTX-040	Bar Antenna	
L2	T63-648	Coil, 5.5 $\mu$ H	
L3	T63-648	Coil, 5.5 $\mu$ H	
TC1	C43-607	Ceramic Trimmer	
TC2	C43-607	Ceramic Trimmer	
TC3	C43-607	Ceramic Trimmer	
TC4	C43-607	Ceramic Trimmer	

## RESISTORS

Ref. Key	Parts No.	Description			
R1	RD1/4VS334K	Resistor	330k $\Omega$	1/4W	
R2	RD1/4VS123K	Resistor	12k $\Omega$	1/4W	
R3	RD1/4VS102K	Resistor	1k $\Omega$	1/4W	
R4	RD1/4VS393K	Resistor	39k $\Omega$	1/4W	
R5	RD1/4VS153K	Resistor	15k $\Omega$	1/4W	

Ref. Key	Parts No.	Description			
R6	RD1/4VS472K	Resistor	4.7k $\Omega$	1/4W	
R7	RD1/4VS153K	Resistor	15k $\Omega$	1/4W	

## CAPACITORS

Ref. Key	Parts No.	Description			
C1	CCDSH220K50	Capacitor	22pF	50V	
C2	CQMA473K50	Capacitor	0.047 $\mu$ F	50V	
C3	CKDYF473Z25	Capacitor	0.047 $\mu$ F	25V	
C4	CKDYF473Z25	Capacitor	0.047 $\mu$ F	25V	
C5	CQMA103K50	Capacitor	0.01 $\mu$ F	50V	

Ref. Key	Parts No.	Description			
C6	CQMA473K50	Capacitor	0.047 $\mu$ F	50V	
C7	CQMA473K50	Capacitor	0.047 $\mu$ F	50V	
C8	CCDVK331J50	Capacitor	330pF	50V	
C9	CQSA111J50	Capacitor	110pF	50V	
C10	CCDSH330K50	Capacitor	33pF	50V	

## 12. AM·IF/FM TUNER UNIT (CWE-145)

- Parts Connection

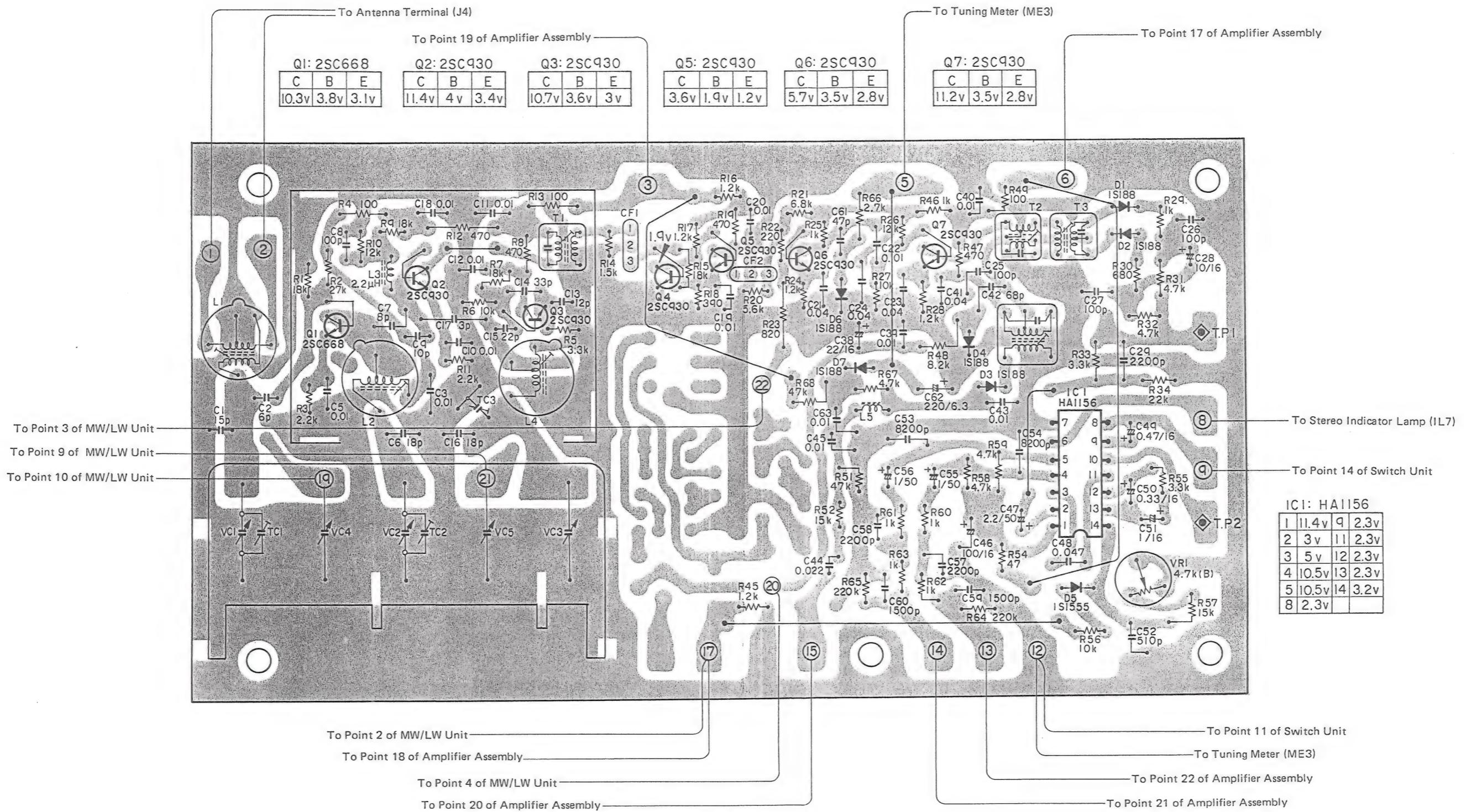


Fig. 28

## ● Parts List

## MISCELLANEOUS

Ref. Key	Parts No.	Description	Notes
IC1	G09-032-A	HA1156-WP	
Q1	G05-043-D	Transistor, 2SC668-D	
Q2	G05-047-D	Transistor, 2SC930-D	
Q3	G05-047-C	Transistor, 2SC930-C	
Q4	G05-047-C, D	Transistor, 2SC930-C, D	
Q5	G05-047-C, D	Transistor, 2SC930-C, D	
Q6	G05-047-C, D	Transistor, 2SC930-C, D	
Q7	G05-047-C, D	Transistor, 2SC930-C, D	
D1	G00-004-A	Diode, 1S188 (FM-1)	
D2	G00-004-A	Diode, 1S188 (FM-1)	
D3	G00-004-A	Diode, 1S188 (FM-1)	
D4	G00-004-A	Diode, 1S188 (FM-1)	
D5	G01-803-A	Diode, 1S1555	
D6	G00-004-A	Diode, 1S188 (FM-1)	
D7	G00-004-A	Diode, 1S188 (FM-1)	
T1	CTC-002	IF Transformer	FM Couple
T2	CTC-011	IF Transformer	FM Detector
T3	CTC-012	IF Transformer	FM Detector
T6	CTE-001	IF Transformer	AM Detector
L1	T22-020	Coil	FM ANT
L2	T21-023	Coil	FM RF
L3	CTF-010	Ferri-inductor 2.2 $\mu$ H	
L4	CTC-001	Coil	FM OSC
L5	CTF-008	Ferri-inductor 100mH	
CF1	CTF-038	Ceramic Filter	
CF2	CTF-038	Ceramic Filter	
VR1	C92-618	Volume	
TC1	CCL-046	Variable Capacitor	
TC2	CCL-046	Variable Capacitor	
TC3	CCG-008	Ceramic Trimmer	
VC1	CCL-046	Variable Capacitor	
VC2	CCL-046	Variable Capacitor	
VC3	CCL-046	Variable Capacitor	
VC4	CCL-046	Variable Capacitor	
VC5	CCL-046	Variable Capacitor	

## AM·IF/FM TUNER UNIT (CWE-145)

### RESISTORS

Ref. Key	Parts No.	Description			Ref. Key	Parts No.	Description		
R1	RD1/VS183J	Resistor	18kΩ	1/4W	R31	RD1/VS472J	Resistor	4.7kΩ	1/4W
R2	RD1/VS273J	Resistor	27kΩ	1/4W	R32	RD1/VS472J	Resistor	4.7kΩ	1/4W
R3	RD1/VS222J	Resistor	2.2kΩ	1/4W	R33	RD1/VS332J	Resistor	3.3kΩ	1/4W
R4	RD1/VS101J	Resistor	100Ω	1/4W	R34	RD1/VS223J	Resistor	22kΩ	1/4W
R5	RD1/VS332J	Resistor	3.3kΩ	1/4W	R45	RD1/VS122J	Resistor	1.2kΩ	1/4W
R6	RD1/VS103J	Resistor	10kΩ	1/4W	R46	RD1/VS102J	Resistor	1kΩ	1/4W
R7	RD1/VS183J	Resistor	18kΩ	1/4W	R47	RD1/VS471J	Resistor	470Ω	1/4W
R8	RD1/VS471J	Resistor	470Ω	1/4W	R48	RD1/VS822J	Resistor	8.2kΩ	1/4W
R9	RD1/VS183J	Resistor	18kΩ	1/4W	R49	RD1/VS101J	Resistor	100Ω	1/4W
R10	RD1/VS123J	Resistor	12kΩ	1/4W	R51	RD1/VS473J	Resistor	47kΩ	1/4W
R11	RD1/VS222J	Resistor	2.2kΩ	1/4W	R52	RD1/VS153J	Resistor	15kΩ	1/4W
R12	RD1/VS471J	Resistor	470Ω	1/4W	R54	RD1/VS470J	Resistor	47Ω	1/4W
R13	RD1/VS101J	Resistor	100Ω	1/4W	R55	RD1/VS332J	Resistor	3.3kΩ	1/4W
R14	RD1/VS152J	Resistor	1.5kΩ	1/4W	R56	RD1/VS103J	Resistor	10kΩ	1/4W
R15	RD1/VS183J	Resistor	18kΩ	1/4W	R57	RD1/VS153J	Resistor	15kΩ	1/4W
R16	RD1/VS122J	Resistor	1.2kΩ	1/4W	R58	RD1/VS472J	Resistor	4.7kΩ	1/4W
R17	RD1/VS122J	Resistor	1.2kΩ	1/4W	R59	RD1/VS472J	Resistor	4.7kΩ	1/4W
R18	RD1/VS391J	Resistor	390Ω	1/4W	R60	RD1/VS102J	Resistor	1kΩ	1/4W
R19	RD1/VS471J	Resistor	470Ω	1/4W	R61	RD1/VS102J	Resistor	1kΩ	1/4W
R20	RD1/VS562J	Resistor	5.6kΩ	1/4W	R62	RD1/VS102J	Resistor	1kΩ	1/4W
R21	RD1/VS682J	Resistor	6.8kΩ	1/4W	R63	RD1/VS102J	Resistor	1kΩ	1/4W
R22	RD1/VS221J	Resistor	220Ω	1/4W	R64	RD1/VS224J	Resistor	220kΩ	1/4W
R23	RD1/VS821J	Resistor	820Ω	1/4W	R65	RD1/VS224J	Resistor	220kΩ	1/4W
R24	RD1/VS122J	Resistor	1.2kΩ	1/4W	R66	RD1/VS272J	Resistor	2.7kΩ	1/4W
R25	RD1/VS102J	Resistor	1kΩ	1/4W	R67	RD1/VS472J	Resistor	4.7kΩ	1/4W
R26	RD1/VS123J	Resistor	12kΩ	1/4W	R68	RD1/VS473J	Resistor	47kΩ	1/4W
R27	RD1/VS103J	Resistor	10kΩ	1/4W					
R28	RD1/VS122J	Resistor	1.2kΩ	1/4W					
R29	RD1/VS102J	Resistor	1kΩ	1/4W					
R30	RD1/VS681J	Resistor	680Ω	1/4W					

## AM·IF/FM TUNER UNIT (CWE-145)

### CAPACITORS

Ref. Key	Parts No.	Description			Ref. Key	Parts No.	Description		
C1	CCDSL150K50	Capacitor	15pF	50V	C40	CKDYF103Z25	Capacitor	0.01μF	25V
C2	CCDSL060D50	Capacitor	6pF	50V	C41	CKDYF403Z25	Capacitor	0.04μF	25V
C3	CKDYF103Z25	Capacitor	0.01μF	25V	C42	CCDSL680K50	Capacitor	68pF	50V
C5	CKDYF103Z25	Capacitor	0.01μF	25V	C43	CQMA103K50	Capacitor	0.01μF	50V
C6	CCDSL180K50	Capacitor	18pF	50V	C44	CQMA223K50	Capacitor	0.022μF	50V
C7	CCDSL080F50	Capacitor	8pF	50V	C45	CQMA103K50	Capacitor	0.01μF	50V
C8	CKDYB101K50	Capacitor	100pF	50V	C46	CEA101P16	Capacitor	100μF	16V
C9	CCDSL100F50	Capacitor	10pF	50V	C47	CEA2R2P50	Capacitor	2.2μF	50V
C10	CKDYF103Z25	Capacitor	0.01μF	25V	C48	CQMA473K50	Capacitor	0.047μF	50V
C11	CKDYF103Z25	Capacitor	0.01μF	25V	C49	CSYAR47M16	Capacitor	0.47μF	16V
C12	CKDYD103M50	Capacitor	0.01μF	50V	C50	CSYAR33M16	Capacitor	0.33μF	16V
C13	CCDSH120K50	Capacitor	12pF	50V	C51	CSYA010M16	Capacitor	1μF	16V
C14	CCDSH330K50	Capacitor	33pF	50V	C52	CQSA511J50	Capacitor	510pF	50V
C15	CCDCH220K50	Capacitor	22pF	50V	C53	CQMA822K50	Capacitor	8200pF	50V
C16	CCDSH180K50	Capacitor	18pF	50V	C54	CQMA822K50	Capacitor	8200pF	50V
C17	CCDCJ030C50	Capacitor	3pF	50V	C55	CEA010P50	Capacitor	1μF	50V
C18	CKDYF103Z25	Capacitor	0.01μF	25V	C56	CEA010P50	Capacitor	1μF	50V
C19	CKDYF103Z25	Capacitor	0.01μF	25V	C57	CQMA222J50	Capacitor	2200pF	50V
C20	CKDYF103Z25	Capacitor	0.01μF	25V	C58	CQMA222J50	Capacitor	2200pF	50V
C21	CKDYF403Z25	Capacitor	0.04μF	25V	C59	CQMA152J50	Capacitor	1500pF	50V
C22	CKDYF103Z25	Capacitor	0.01μF	25V	C60	CQMA152J50	Capacitor	1500pF	50V
C23	CKDYF403Z25	Capacitor	0.04μF	25V	C61	CCDSL470K50	Capacitor	47pF	50V
C24	CKDYF403Z25	Capacitor	0.04μF	25V	C62	CEA221P16	Capacitor	220μF	16V
C25	CKDYB101K50	Capacitor	100pF	50V	C63	CQMA103K50	Capacitor	0.01μF	50V
C26	CKDYB101K50	Capacitor	100pF	50V					
C27	CKDYB101K50	Capacitor	100pF	50V					
C28	CEA100P16	Capacitor	10μF	16V					
C29	CQMA222J50	Capacitor	2200pF	50V					
C38	CEA220P16	Capacitor	22μF	16V					
C39	CKDYF103Z25	Capacitor	0.01μF	25V					

## 13. MISCELLANEOUS PARTS LIST KH-3500

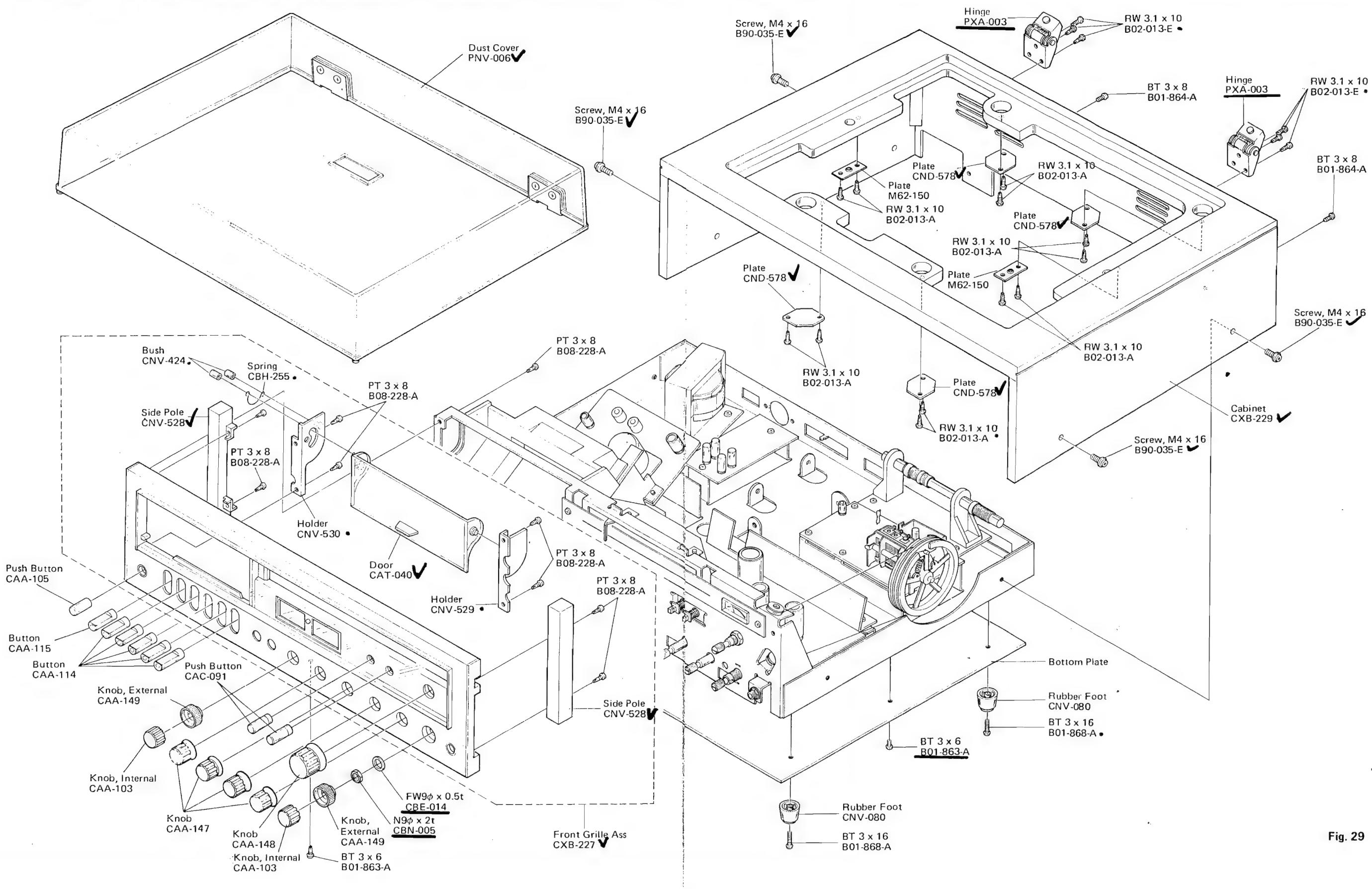
Ref. Key	Parts No.	Description	Notes
T1	CTT-072	Power Transformer	
HD1	CPB-023	Head	Rec/playback
HD2	CPB-024	Head	Erase
M	CXM-044	Motor	
SO	CXP-019	Solenoid Ass	
IL1	CEL-033	Lamp, 14V 60mA	Recording Ind.
IL2	CEL-033	Lamp, 14V 60mA	Level Meter
IL3	CEL-031	Lamp, 6.3V 150mA	Dial
IL4	CEL-031	Lamp, 6.3V 150mA	Dial
IL5	CEL-033	Lamp, 14V 60mA	Cassette Door
IL6	CEL-020	Lamp, 14V 60mA	Tuning Meter
IL7	CEL-033	Lamp, 14V 60mA	Stereo Ind.
ME1	CAW-014	Level Meter	(L)
ME2	CAW-014	Level Meter	(R)
ME3	CAW-030	Tuning Meter	
J1	CKP-010	Jack, Inlet	AC Input
J2	K72-627	Headphone Jack	Headphone
J3	CKF-033	Speaker Terminal	Speaker
J4	K31-013	Antenna Terminal	Antenna
J5	CKN-014	Mic Jack	Mic (L)
J6	CKN-014	Mic Jack	Mic (R)
J7	CKN-031	Jack	Phono (L)
J8	CKN-031	Jack	Phono (R)
J9	CKB-011	Pin Jack, 2P	AUX
J10	CDE-275	Connector, 3P	Player Power
S1	CSG-064	Push Switch	Power
S2	CSN-039	Leaf Switch	Motor
S3	CSN-021	Reed Switch	Sensing
S4	CSN-038	Leaf Switch	Pause
S5	CSN-037	Leaf Switch	Play
S6	CKA-004	Voltage Selector	
C1	CCG-003	Capacitor, 0.01 $\mu$ F	
C2	CCG-003	Capacitor, 0.01 $\mu$ F	
R1	RD½PS221J	Resistor, 220 $\Omega$ ½W	
R2	RD½PS221J	Resistor, 220 $\Omega$ ½W	

## 14. CABINET EXPLODED VIEW

KH-3500

NOTICE: Parts whose parts numbers are omitted are subject to being not supplied.

## CABINET EXPLODED VIEW



## 15. CHASSIS EXPLODED VIEW

NOTICE: Parts whose parts numbers are omitted are subject to being not supplied.

IIIKH-3500

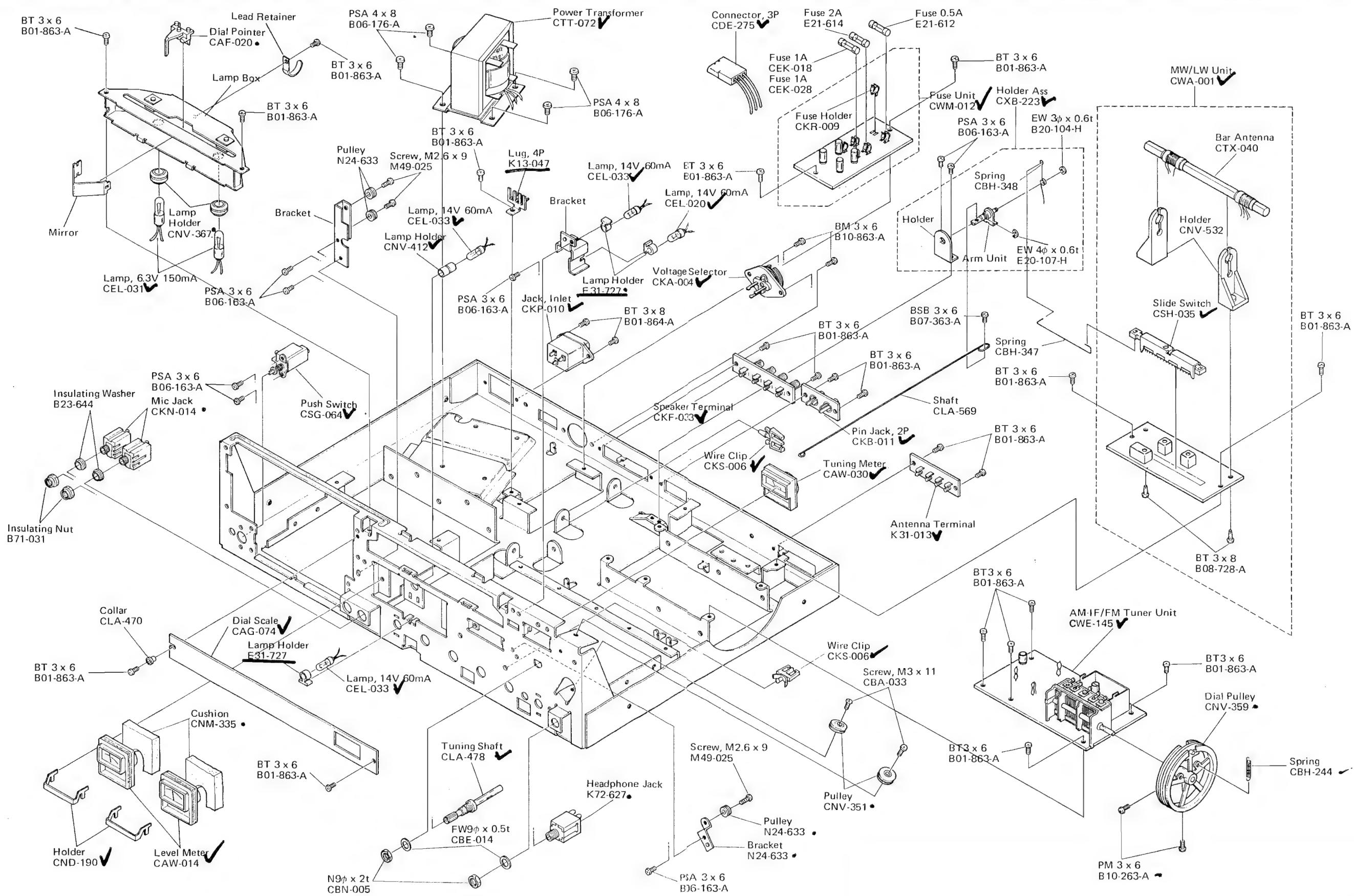
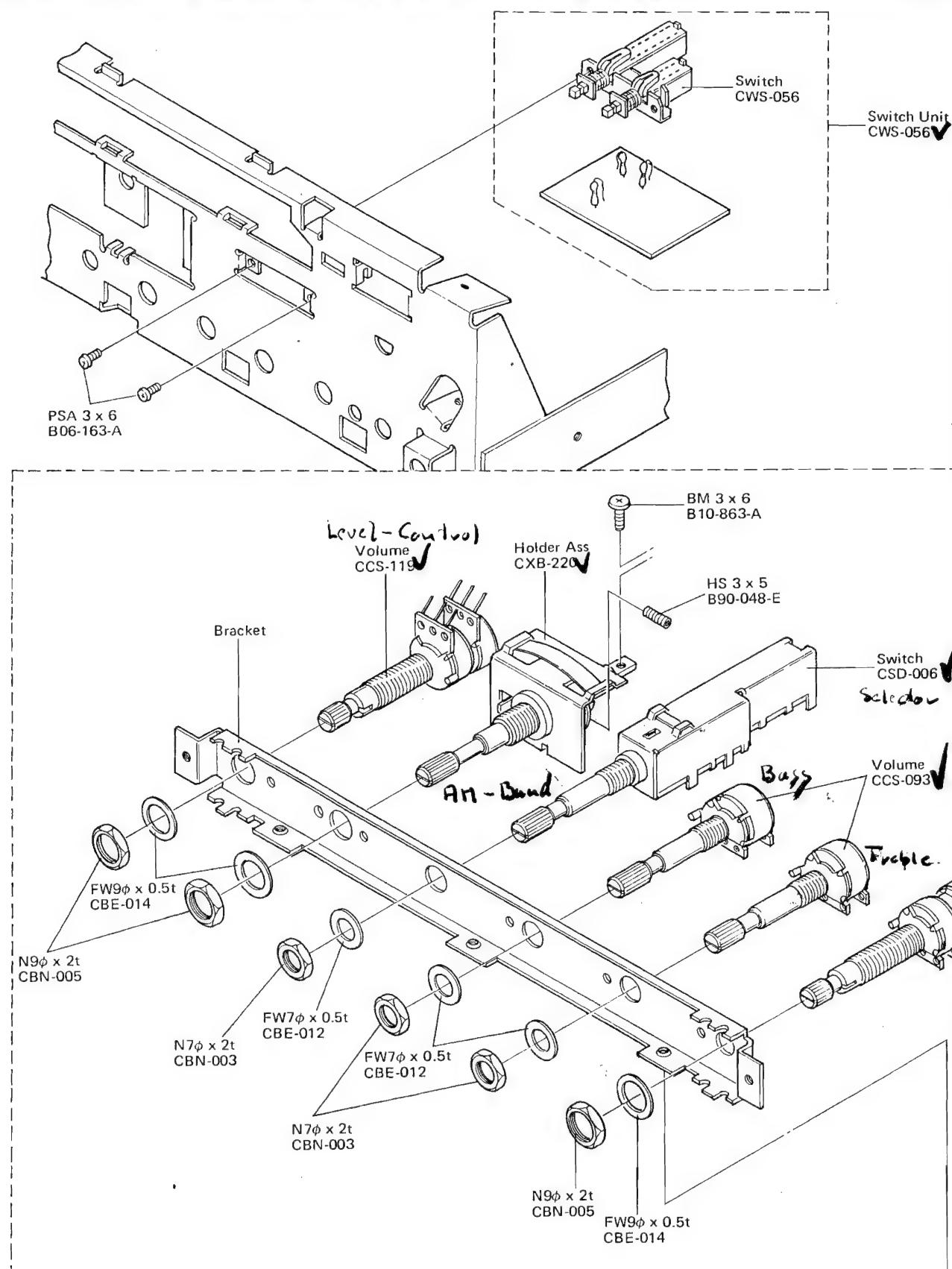


Fig. 30

## 16. AMPLIFIER ASSEMBLY EXPLODED VIEW

KH-3500



## AMPLIFIER ASSEMBLY EXPLODED VIEW

NOTICE: Part whose parts number is omitted is subject to being not supplied.

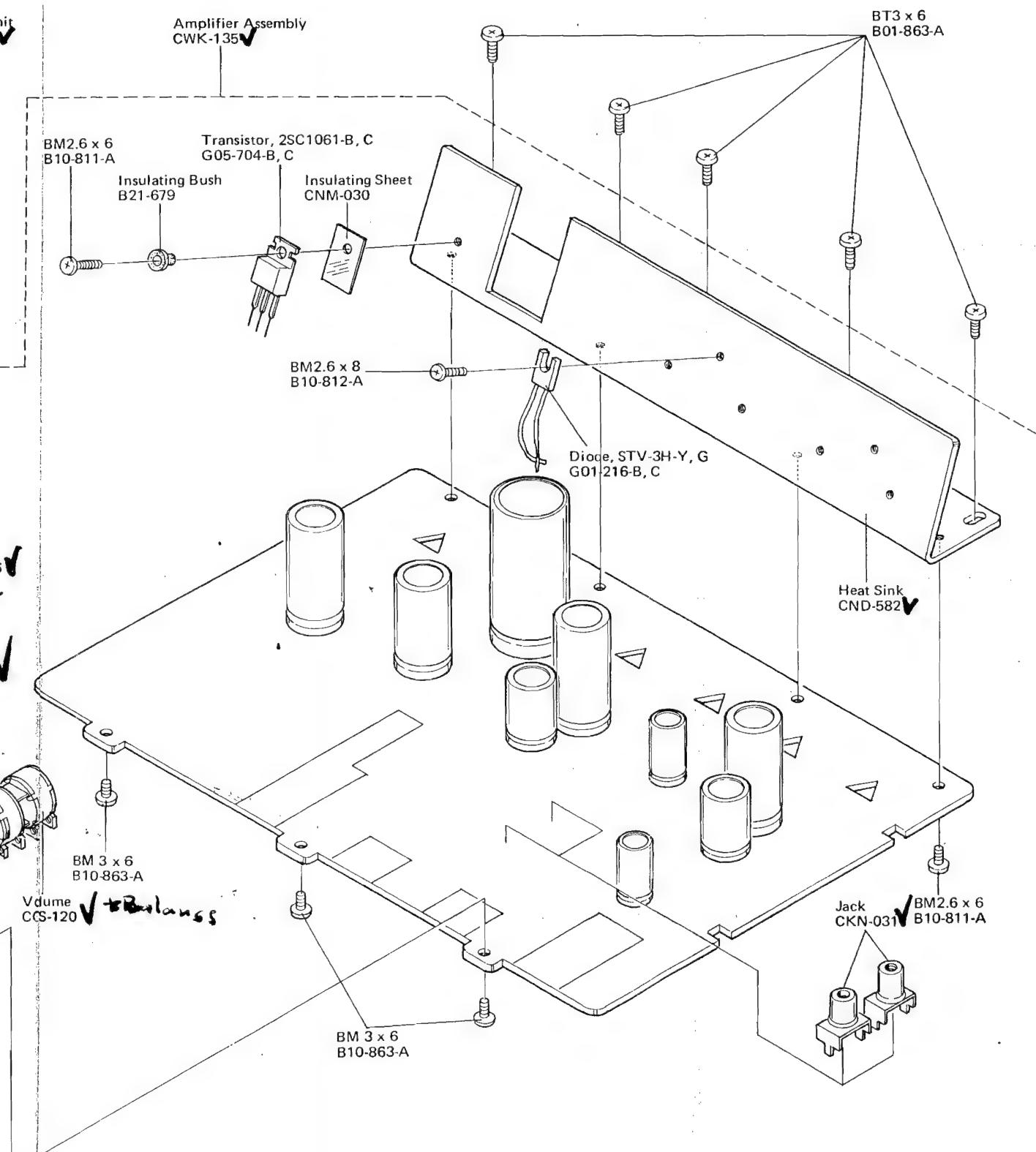


Fig. 31

## 17. CASSETTE MECHANISM (TOP) EXPLODED VIEW

NOTICE: Parts whose parts numbers are omitted are subject to being not supplied. KH-3500

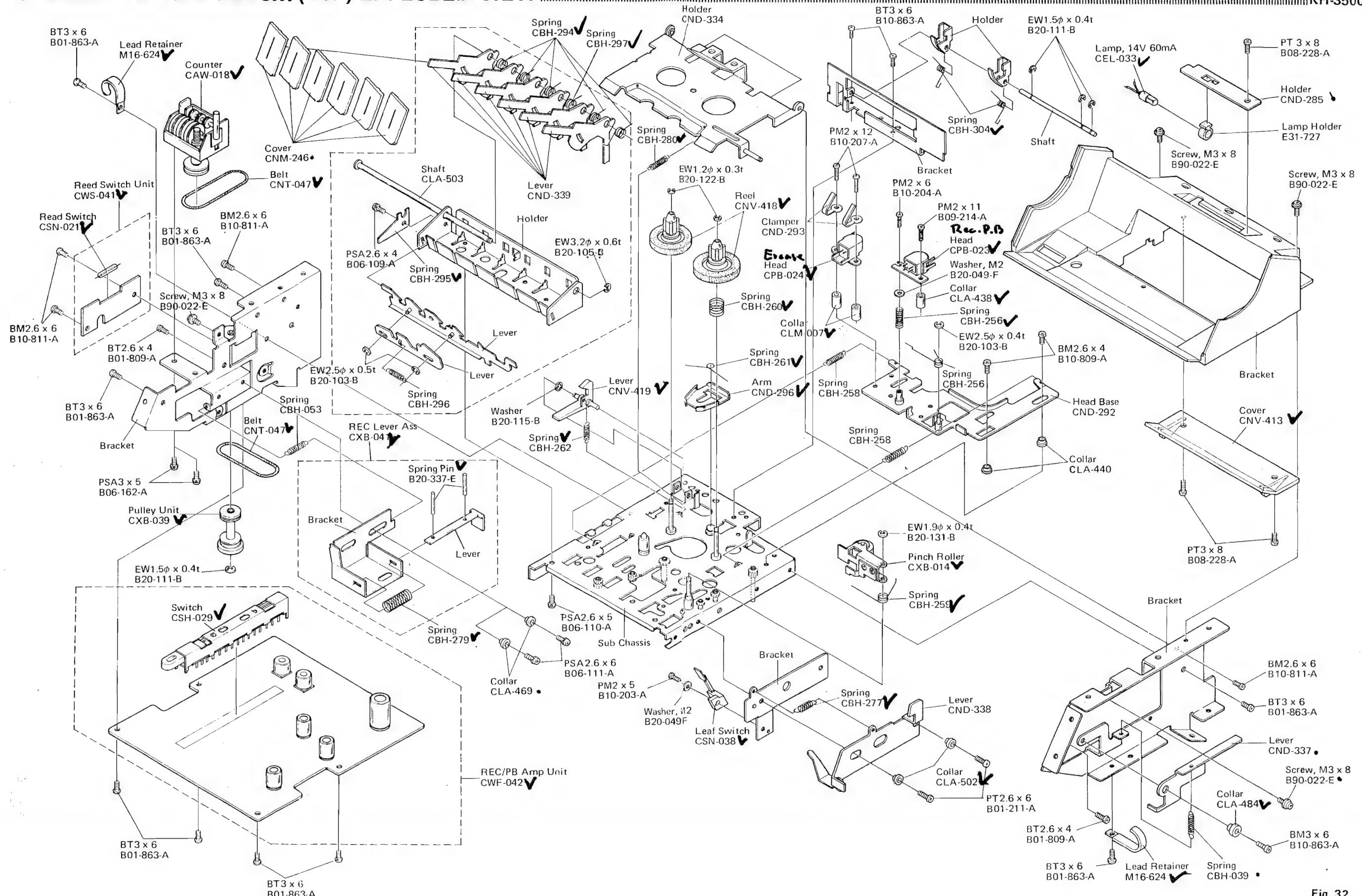


Fig. 32

## 18. CASSETTE MECHANISM

Those parts numbers are omitted are subject to being not supplied.

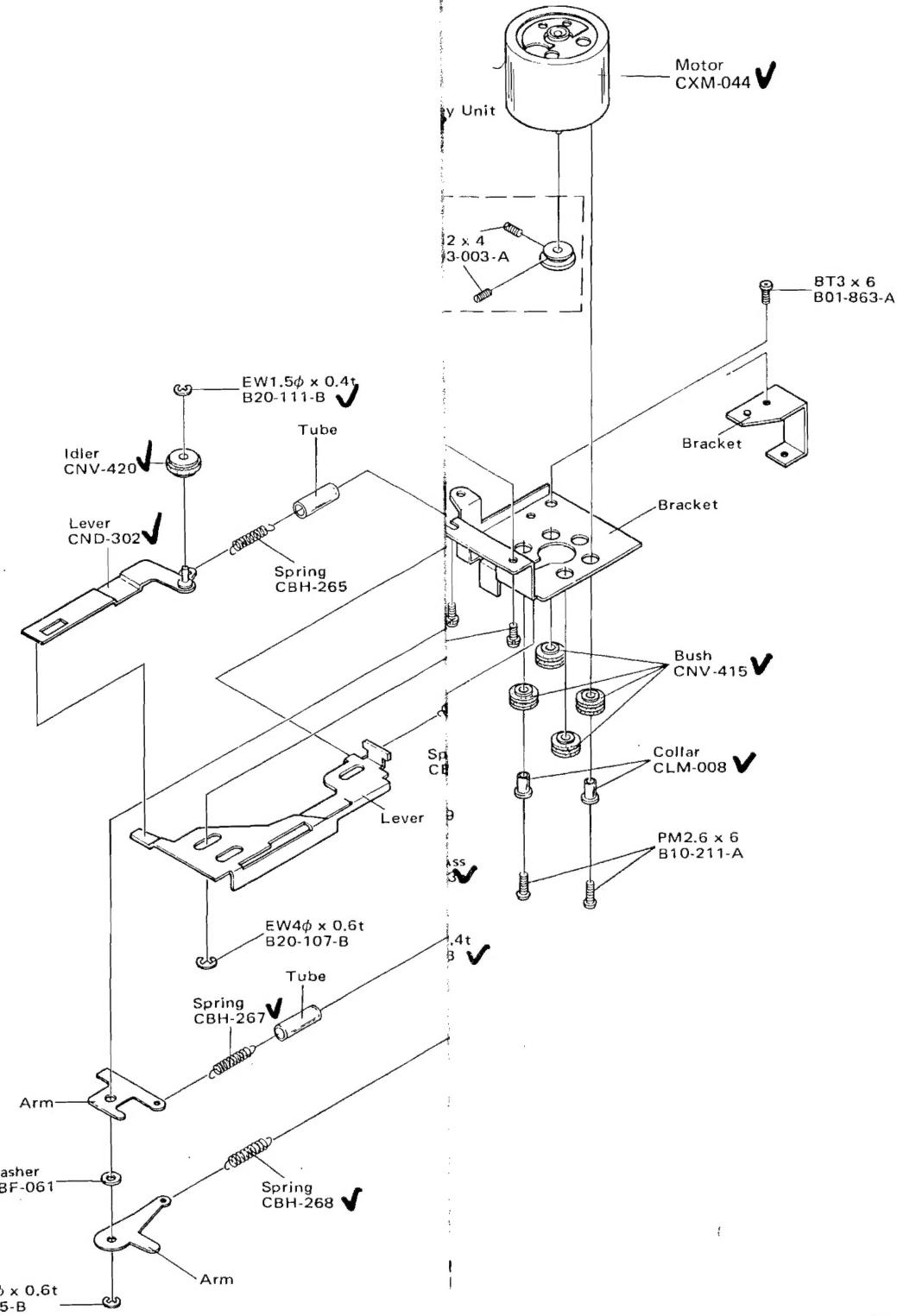


Fig. 33

NOTICE: Parts whose parts numbers are omitted are subject to being not supplied. **KH-3500**

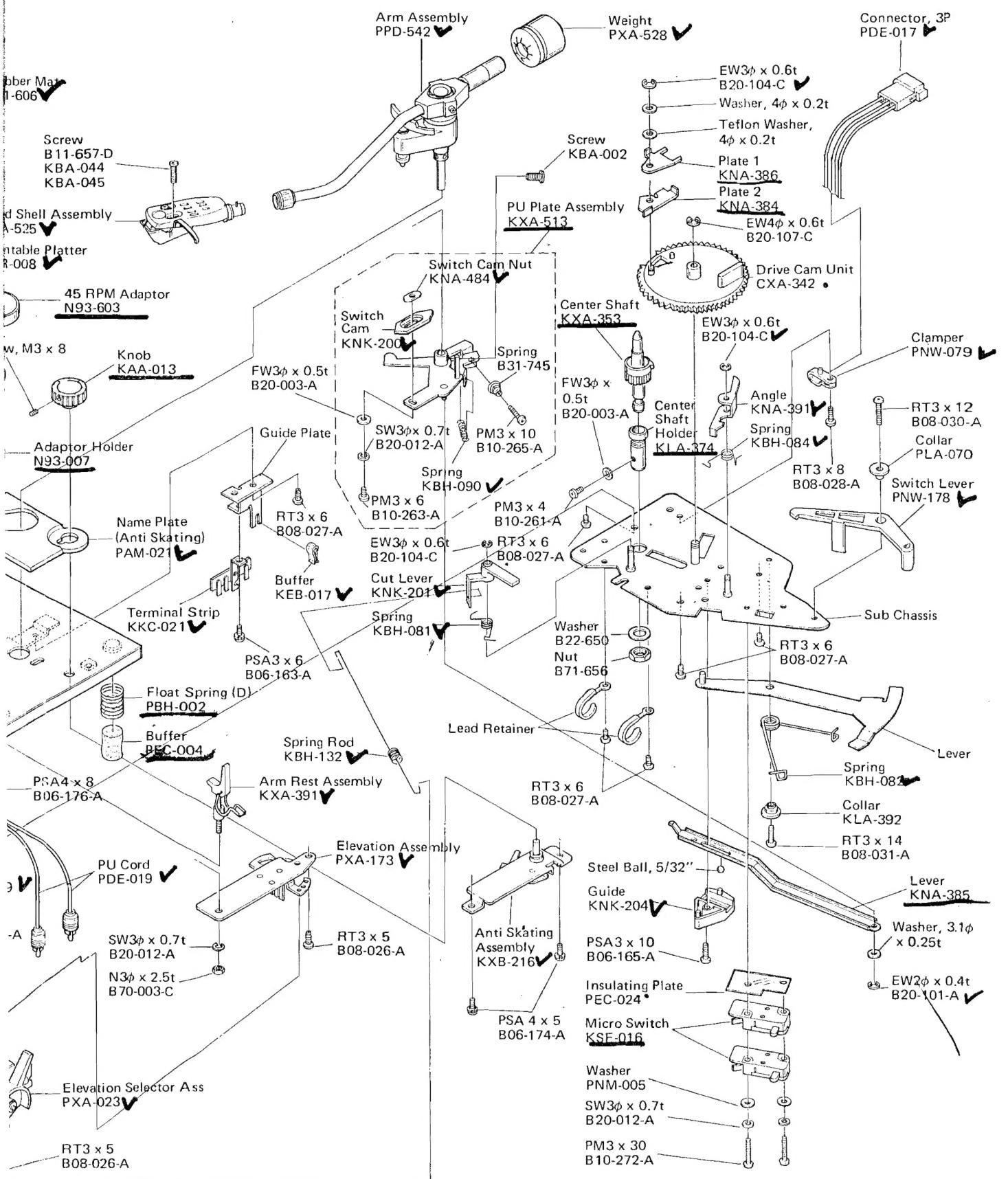


Fig. 34

## 20. PACKING METHOD

KH-35

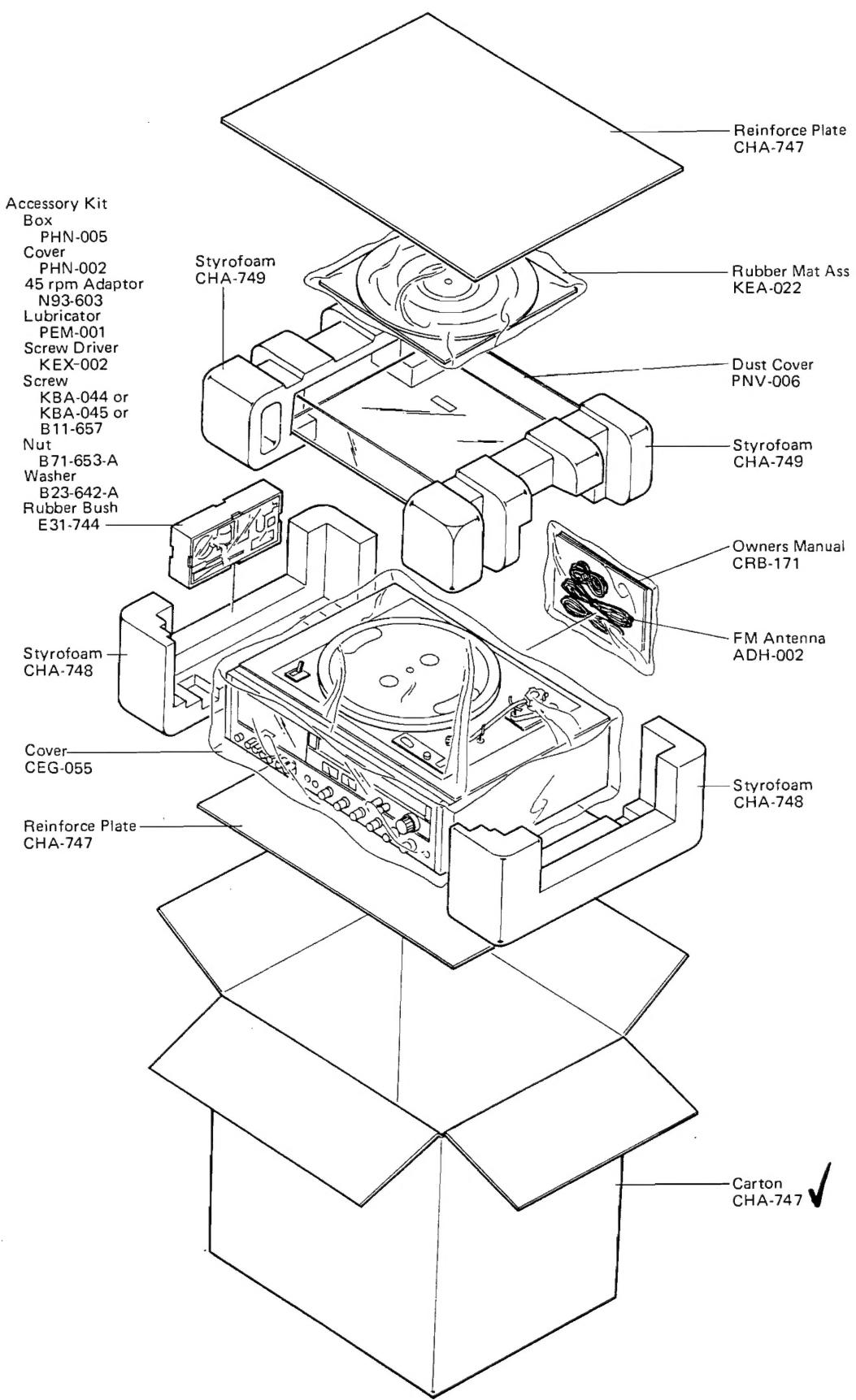
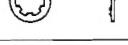
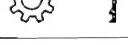
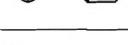


Fig. 35

## 21. NOMENCLATURE OF SCREWS, WASHERS AND NUTS

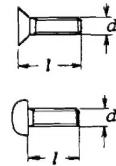
The following symbols stand for screws, washers and nuts as shown in exploded view.

Symbol	Description	Shape
RT	Brazier head tapping screw	
PT	Pan head tapping screw	
BT	Binding head tapping screw	
CT	Countersunk head tapping screw	
TT	Truss head tapping screw	
OCT	Oval countersunk head tapping screw	
PM	Pan head machine screw	
CM	Countersunk head machine screw	
OCM	Oval countersunk head machine screw	
TM	Truss head machine screw	
BM	Binding head machine screw	
PSA	Pan head screw with spring lock washer	
PSB	Pan head screw with spring lock washer and flat washer	
PSF	Pan head screw with flat washer	

Symbol	Description	Shape
EW	E type washer	
FW	Flat washer	
SW	Spring lock washer	
N	Nut	
WN	Washer faced nut	
ITW	Internal toothed lock washer	
OTW	External toothed lock washer	
SC	Slotted set screw (Cone point)	
SF	Slotted set screw (Flat point)	
HS	Hexagon socket headless set screw	
OCW	Oval countersunk head wood screw	
CW	Countersunk head wood screw	
RW	Round head wood screw	

### EXAMPLE

PM 3x8	length in mm ( l )
	diameter in mm ( d )
	Symbol



FW 9φ x 1 <sup>t</sup>	thickness in mm ( t )
	diameter in mm ( d )
	Symbol

